FREDERICK JOHN WULLING, Ph.G., Phm.D., LL.M., Phm.M. (Hon. Causa)

Sixty-fourth President of the American Pharmaceutical Association.

Frederick J. Wulling is a native of Brooklyn, N. Y., where he was born in 1866. He was president of the American Conference of Pharmaceutical Faculties 1914–15, and president of the American Pharmaceutical Association 1916–17. For biographical sketch, see p. 1488, Journal A. Ph. A. for December 1915. His presidential address is printed in September number of the Journal for 1917, with a further reference in the October issue of that year; action thereon is reported on p. 1003 of the November number, 1917. Ex-President Wulling is now a member of the Council A. Ph. A

YEAR BOOK

OF THE

AMERICAN PHARMACEUTICAL ASSOCIATION

1916

Volume 5

CONTAINING THE FIFTY-NINTH ANNUAL REPORT
ON THE PROGRESS OF PHARMACY, AND
THE CONSTITUTION, BY-LAWS,
AND ROLL OF MEMBERS

CORRESPONDING TO VOLUME SIXTY-FOUR OF THE
FORMER PROCEEDINGS OF THE
AMERICAN PHARMACEUTICAL ASSOCIATION

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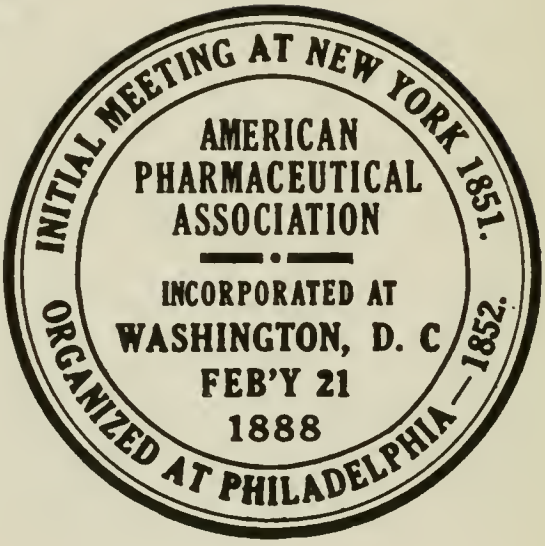
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ASSOCIATION
INCORPORATED AT
WASHINGTON, D. C
FEB'Y 21
1888
ORGANIZED AT PHILADELPHIA—1852.

American Pharmaceutical Association

Organized: Philadelphia, 1852 Incorporated: Washington, D. C., 1888

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THEO. D. WETTERSTROEM, Cincinnati.

Indiana—F. W. MEISSNER, JR., *Chairman*, La Porte.
C. B. JORDAN, Lafayette.
EMIL REYER, South Bend.
W. H. RUDDER, Salem.
R. L. GREEN, Notre Dame.

Kentucky—C. S. PORTER, *Chairman*, Lexington.
ADDISON DIMMITT, Louisville.
J. W. GAYLE, Frankfort.
EDWARD L. PIECK, Covington
JOSEPH B. WELSH, Paducah.

Michigan—MARTIN H. GOODALE, *Chairman*, Battle Creek.
A. A. WHEELER, Detroit.
WILLIAM C. KIRCHGESSNER, Grand Rapids.
HARRY B. MASON, Detroit.

Wisconsin—E. S. THATCHER, *Chairman*, Fond du lac.
SOLOMON A. ECKSTEIN, Milwaukee.
EDWARD WILLIAMS, Madison.

* Deceased.

District No. 4.—Chairman—JAMES O. BURGE, 1502 McGavock Street, Nashville, Tenn. *Including*—North Carolina, South Carolina, Tennessee, Georgia, Alabama, Mississippi, Florida, Arkansas, Louisiana, Oklahoma, Texas, Panama, Cuba, and West Indies.

Alabama—CARL WHORTON, *Chairman*, Gadsden.
W. E. BINGHAM, Tuscaloosa.
BERNHARD H. EICHOLD, Mobile.
LAWRENCE C. LEWIS, Tuskegee.
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Arkansas—JOHN S. GIBSON, *Chairman*, Hope.
WILLIAM L. DEWOODY, Pine Bluff.
M. A. EISELE, Hot Springs.
JAMES M. SPARKS, Fort Smith.

Cuba—JOSÉ GUILLERMO DIAZ, *Chairman*, Havana.
JOSÈ P. ALACÁN, Havana.
FRANCISCO HERRERA, Havana.

Florida—E. BERGER, *Chairman*, Tampa.
WM. D. JONES, Jacksonville.
D. W. RAMSAUR, Palatka.

Georgia—ROBERT H. LAND, JR., *Chairman*, Augusta.
MAX MORRIS, Macon.
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Louisiana—PHILIP ASHER, *Chairman*, New Orleans.
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Mississippi—HENRY M. FASER, *Chairman*, University.
GUS C. KENDALL, Meridian.
J. C. MCGEE, Jackson.

Texas—ROBERT H. WALKER, *Chairman*, Gonzales.
HERMAN A. NESTER, San Antonio.
JACOB SCHRODT, Dallas.
HARRY DEATHE, Cooper.

Panama — BOLIVAR JURADO, *Chairman*, Panama City.
ROBERT V. JOHNSON, Canal Zone.
OSWALD CHAPMAN, Panama City.

Oklahoma—J. C. BURTON, *Chairman*, Stroud.
EDWIN DEBARR, Norman.
FRANK A. DINKLER, Hennesey.

North Carolina—K. E. BENNETT, *Chairman*, Bryson City.
CHARLES P. GREYER, Morgantown.
JOHN H. HARDIN, Wilmington.
EDWARD V. ZOELLER, Tarboro.

South Carolina—JOSEPH B. HYDE, *Chairman*, Charleston.
HENRY PLENGE, Charleston.
W. H. ZEIGLER, Charleston.

Tennessee—WILLIAM R. WHITE, *Chairman*, Nashville.
IRA B. CLARK, Nashville.
W. I. GATES, Whiteville.
J. E. JUSTICE, Clarksville.
T. J. SHANNON, Sharon.
F. W. WARD, Memphis.

District No. 5.—Chairman—WILBER J. TEETERS, Iowa College of Pharmacy, Iowa City, Iowa. *Including*—Missouri, Iowa, Kansas, Nebraska, Minnesota, North Dakota, and South Dakota.

Iowa—G. SCHERLING, *Chairman*, Sioux City.
ELBERT O. KAGY, Des Moines.
JOHN M. LINDLY, Des Moines.
AL FALKENHAINER, Algona.

Missouri—H. M. WHELPLEY, *Chairman*, St. Louis.
R. A. DOYLE, East Prairie.
HENRY D. LLEWELLYN, Mexico.
WM. MITTELBACH, Booneville.
D. V. WHITNEY, Kansas City.
JEROME A. WILKERSON, St. Louis.

Kansas—L. D. HAVENHILL, *Chairman*, Lawrence.
J. S. CHISM, Wichita.
MAXIMILIAN W. FRIEDENBURG, Winfield.
D. VON RIESEN, Marysville.

Minnesota—E. L. NEWCOMB, *Chairman*, Minneapolis.
WILLIAM A. ABBETT, Duluth.
WM. A. FROST, St. Paul.
CHAS. H. HUHN, Minneapolis.
ROBERT L. MORLAND, Worthington.

Nebraska—AUTUMN V. PEASE, *Chairman*, Fairbury.
HENRY R. GERING, Omaha.
EDMOND O. HASCHENBURGER, Lincoln.
R. A. LYMAN, Lincoln.

North Dakota—W. P. PORTERFIELD, *Chairman*, Fargo.
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South Dakota—E. C. BENT, *Chairman*, Dell Rapids.
H. A. KIETH, Lake Preston.
DAVID F. JONES, Watertown.
FRANK D. KRIEBS, Beresford.
GEORGE F. SWARTZ, Redfield.

District No. 6.—Chairman—JOSEPH L. LENGFELD, 272 Post Street, San Francisco, California. *Including*—California, Nevada, Utah, Colorado, New Mexico.

California—JOSEPH L. LENGFELD, *Chairman*, San Francisco.
FRANKLIN T. GREEN, San Francisco.
KENNETH B. BOWERMAN, San Francisco.
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GEORGE H. P. LICHTHARDT, Sacramento.
J. G. MUNSON, San José.
EDWARD G. BINZ, Los Angeles.

Colorado—W. T. HOVER, *Chairman*, Denver.
CHARLES J. CLAYTON, Denver.
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FRANK E. MORTENSON, Pueblo.
FERDINAND W. NITARDY, Denver.

Nevada—JOSEPH M. TABER, *Chairman*, Elko.
W. R. ENGLERT, Elko.

New Mexico—BERNARD C. RUPPE, *Chairman*, Albuquerque.
E. G. MURPHEY, East Las Vegas.

Utah—W. H. DAYTON, *Chairman*, Salt Lake City.
JOHN CULLEY, Ogden.
W. L. EDDY, Brigham City.

District No. 7.—Chairman—JOHN M. A. LAUE, 175 3rd Street, Portland, Oregon. *Including*—Washington, Oregon, Idaho, Montana, Wyoming, Alaska.

Idaho—H. H. WHITTELSEY, *Chairman*, Pocatello.
CLARENCE O. BALLOU, Boise.
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GEORGE WELDON, Paris.
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Oregon—C. M. MCKELLIPS, *Chairman*, Portland.
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MRS. EMILY C. MCRAE, Spokane.
CORNELIUS OSSEWARD, Seattle.
A. W. LINTON, Seattle.

District No. 8, British America.—Chairman—CHARLES F. HEEBNER, Ontario College of Pharmacy, Toronto, Ontario.

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LIST OF OFFICERS OF THE ASSOCIATION SINCE ITS ORGANIZATION

(NAMES OF DECEASED OFFICERS IN ITALICS)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Oct. 6, 1852	Philadelphia, Pa.....	*Daniel B. Smith*, Philadelphia.	*George W. Andrews*, Baltimore.	*Samuel M. Colcord*, Boston.	*C. Augustus Smith*, Cincinnati.
Aug. 24, 1853	Boston, Mass.....	*William A. Brewer*, Boston.	*George D. Coggeshall*, New York.	*Alexander Duval*, Richmond, Va.	*Charles B. Guthrie*, Memphis, Tenn.
July 25, 1854	Cincinnati, O.....	*William B. Chapman*, Cincinnati.	*Henry T. Cummings*, Portland, Me.	*John Meakim*, New York.	*Joseph Laidley*, Richmond, Va.
Sept. 11, 1855	New York, N. Y.....	*John Meakim*, New York.	*Charles B. Guthrie*, Memphis, Tenn.	*Charles Ellis*, Philadelphia.	*Henry F. Fish*, Waterbury, Conn.
Sept. 9, 1856	Baltimore, Md.....	*George W. Andrews*, Baltimore.	*John I. Kidwell*, Washington, D. C.	*Frederick Stearns*, Detroit, Mich.	*Henry T. Kiersted*, New York.
Sept. 8, 1857	Philadelphia, Pa.....	*Charles Ellis*, Philadelphia.	*James Cooke*, Fredericksburg, Va.	*Samuel P. Peck*, Bennington, Vt.	*A. E. Richards*, Plaquemine, La.
Sept. 14, 1858	Washington, D. C....	*John I. Kidwell*, Georgetown, D. C.	*Edward R. Squibb*, Brooklyn, N. Y.	*James O'Gallagher*, St. Louis.	*Robert Battey*, Rome, Ga.
Sept. 13, 1859	Boston, Mass.....	*Samuel M. Colcord*, Boston.	*William Procter, Jr.*, Philadelphia.	*Joseph Roberts*, Baltimore.	*Edwin O. Gale*, Chicago.
Sept. 11, 1860	New York, N. Y.....	*Henry T. Kiersted*, New York.	*William J. M. Gordon*, Cincinnati.	*William S. Thompson*, Baltimore.	*Theodore Metcalf*, Boston.
Aug. 27, 1862	Philadelphia, Pa.....	*Wm. Procter, Jr.*, Philadelphia.	*John Milhau*, New York.	*Eugene L. Massot*, St. Louis.	*J. Faris Moore*, Baltimore.
Sept. 8, 1863	Baltimore, Md.....	*J. Faris Moore*, Baltimore.	*John M. Maisch*, Philadelphia.	*Chas. A. Tufts*, Dover, N. H.	*George W. Weyman*, Pittsburgh.
Sept. 21, 1864	Cincinnati, O.....	*William J. M. Gordon*, Cincinnati.	*Richard H. Stabler*, Alexandria.	*Enno Sander*, St. Louis.	*Thomas Hollis*, Boston.

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Sept. 5, 1865	Boston, Mass.....	*Henry W. Lincoln*, Boston.	*George C. Close*, Brooklyn, N. Y.	*Elijah W. Sackrider*, Cleveland, O.	*Charles A. Heinitsh*, Lancaster, Pa.
Aug. 22, 1866	Detroit, Mich.....	*Frederick Stearns*, Detroit, Mich.	*Edward Parrish*, Philadelphia.	*Ezekiel H. Sargent*, Chicago.	*John W. Shedden*, New York.
Sept. 10, 1867	New York, N. Y.....	*John Milhau*, New York.	*Robert J. Brown*, Leavenworth, Kans.	*N. Hynson Jennings*, Baltimore.	*Daniel Henchman*, Boston.
Sept. 8, 1868	Philadelphia, Pa.....	*Edward Parrish*, Philadelphia.	*Ferris Bringhurst*, Wilmington, Del.	*Edward S. Wayne*, Cincinnati.	*Albert E. Ebert*, Chicago.
Sept. 7, 1869	Chicago, Ill.....	*Ezekiel H. Sargent*, Chicago.	*Ferdinand W. Sennewald*, St. Louis.	*John H. Pope*, New Orleans.	*Joel S. Orne*, Cambridgeport, Mass.
Sept. 13, 1870	Baltimore, Md.....	*Richard H. Stabler*, Alexandria, Va.	Fleming G. Grieve, Milledgeville, Ga.	*James G. Steele*, San Francisco.	*Eugene L. Massot*, St. Louis.
Sept. 12, 1871	St. Louis, Mo.....	*Enno Sander*, St. Louis.	*C. Lewis Diehl*, Louisville, Ky.	*George F. H. Markoe*, Boston.	*Matthew F. Ash*, Jackson, Miss.
Sept. 3, 1872	Cleveland, O.....	*Albert E. Ebert*, Chicago.	*Samuel S. Garrigues*, East Saginaw, Mich.	*Edward P. Nichols*, Newark, N. J.	*Henry C. Gaylord*, Cleveland, O.
Sept. 16, 1873	Richmond, Va.....	John F. Hancock, Baltimore.	*William Saunders*, London, Ont.	John T. Buck, Jackson, Miss.	*Paul Balluff*, New York.
Sept. 8, 1874	Louisville, Ky.....	*C. Lewis Diehl*, Louisville, Ky.	*Joseph Roberts*, Baltimore.	*William T. Wenzell*, San Francisco.	*Augustus R. Bayley*, Cambridgeport, Mass.
Sept. 7, 1875	Boston, Mass.....	*George F. H. Markoe*, Boston.	*Frederick Hoffman*, New York.	*T. Roberts Baker*, Richmond, Va.	*Christian F. G. Meyer*, St. Louis.
Sept. 12, 1876	Philadelphia, Pa.....	*Charles Bullock*, Philadelphia.	*Samuel A. D. Sheppard*, Boston.	*Gustavus J. Luhn*, Charleston, S. C.	*Jacob D. Wells*, Cincinnati.

LIST OF OFFICERS (Continued)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Sept. 4, 1877	Toronto, Can.....	*William Saunders*, London, Ont.	*Ewen McIntyre*, New York.	*John Ingalls*, Macon, Ga.	*Emlen Painter*, San Francisco.
Nov. 26, 1878	Atlanta, Ga.....	*Gustavus J. Luhn*, Charleston, S. C.	*Frederick T. Whiting*, Great Barrington, Mass.	*Henry J. Rose*, Toronto, Can.	*William H. Crawford*, St. Louis.
Sept. 9, 1879	Indianapolis, Ind.....	*George W. Sloan*, Indianapolis, Ind.	*T. Roberts Baker*, Richmond, Va.	Joseph L. Lemberger, Lebanon, Pa.	*Philip C. Candidus*, Mobile, Ala.
Sept. 14, 1880	Saratoga, N. Y.....	*James T. Shinn*, Philadelphia.	George H. Schafer, Fort Madison, Ia.	*William S. Thompson*, Washington, D. C.	*William Simpson*, Raleigh, N. C.
Aug. 23, 1881	Kansas City, Mo.....	*P. Wendover Bedford*, New York.	*Emlen Painter*, San Francisco.	George Leis, Lawrence, Kans.	*John F. Judge*, Cincinnati.
Sept. 12, 1882	Niagara Falls, N. Y..	*Charles A. Heinitsch*, Lancaster, Pa.	*John Ingalls*, Macon, Ga.	*Louis Dohme*, Baltimore.	*William B. Blanding*, Providence, R. I.
Sept. 11, 1883	Washington, D. C....	*William S. Thompson*, Washington, D. C.	*Charles Rice*, New York.	*Frederick H. Masi*, Norfolk, Va.	Edward W. Runyon, San Francisco.
Aug. 26, 1884	Milwaukee, Wis.....	*John Ingalls*, Macon, Ga.	*John A. Dadd*, Milwaukee, Wis.	*Henry Canning*, Boston.	*Charles F. Goodman*, Omaha, Neb.
Sept. 8, 1885	Pittsburgh, Pa.....	*Joseph Roberts*, Baltimore.	*Albert H. Hollister*, Madison, Wis.	*Albert B. Prescott*, Ann Arbor, Mich.	*Joseph S. Evans*, West Chester, Pa.
Sept. 7, 1886	Providence, R. I.....	*Chas. A. Tufts*, Dover, N. H.	*Henry J. Menninger*, Brooklyn, N. Y.	*M. W. Alexander*, St. Louis.	*Norman A. Kuhn*, Omaha, Neb.
Sept. 5, 1887	Cincinnati, O.....	John U. Lloyd, Cincinnati.	*M. W. Alexander*, St. Louis.	*A. K. Finlay*, New Orleans.	*Karl Simmon*, St. Paul, Minn.
Sept. 3, 1888	Detroit, Mich.....	*M. W. Alexander*, St. Louis.	Jas. Vernor, Detroit, Mich.	Fred Wilcox, Waterbury, Conn.	*Alvin A. Yeager*, Knoxville, Tenn.
June 24, 1889	San Francisco, Cal....	*Emlen Painter*, New York.	*Karl Simmon*, St. Paul, Minn.	*Wm. M. Searby*, San Francisco.	Joseph W. Eckford, Aberdeen, Miss.

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Sept. 8, 1890	Old Pt. Comfort, Va..	*A. B. Taylor*, Philadelphia.	A. B. Stevens, Ann Arbor, Mich.	*Chas. E. Dohme*, Baltimore.	James M. Good, St. Louis.
April 27, 1891	New Orleans, La.....	*A. K. Finlay*, New Orleans.	*Geo. J. Seabury*, New York.	W. H. Torbert, Dubuque, Ia.	L. T. Dunning, Sioux Falls, S. D.
July 14, 1892	Profile House, N. H.	*Jos. P. Remington*, Philadelphia.	*A. P. Preston*, Portsmouth, N. H.	*Sidney P. Watson*, Atlanta, Ga.	*Wm. H. Averill*, Frankfort, Ky.
Aug. 14, 1893	Chicago, Ill.....	Edgar L. Patch, Boston.	*Leo Eliel*, South Bend, Ind.	*Wiley Rogers*, Louisville, Ky.	*Chas. Caspari, Jr.*, Baltimore.
Sept. 3, 1894	Asheville, N. C.....	*William Simpson*, Raleigh, N. C.	Chas. M. Ford, Denver, Colo.	Jno. N. Hurty, Indianapolis, Ind.	*Jas. E. Morrison*, Montreal, Can.
Aug. 14, 1895	Denver, Colo.....	James M. Good, St. Louis.	*Chas. E. Dohme*, Baltimore.	A. Brandeburger, Jefferson City, Mo.	*Mrs. M. O. Miner*, Hiawatha, Kans.
Aug. 12, 1896	Montreal, Can.....	*Joseph E. Morrison*, Montreal, Can.	Geo. F. Payne, Atlanta, Ga.	Wm. A. Frost, St. Paul, Minn.	Geo. W. Parisen, Perth Amboy, N. J.
Aug. 23, 1897	Lake Minnetonka, Minn.....	*Henry M. Whitney*, Lawrence, Mass.	*George C. Bartells*, Camp Point, Ill.	*Wm. S. Thompson*, Washington, D. C.	*Jacob A. Miller*, Harrisburg, Pa.
Aug. 29, 1898	Baltimore, Md.....	*Charles E. Dohme*, Baltimore.	George F. Payne, Atlanta, Ga.	James H. Beal, Scio, O.	Josie A. Wanous, Minneapolis, Minn.
Sept. 4, 1899	Put-in-Bay, O.....	*Albert B. Prescott*, Ann Arbor, Mich.	Lewis C. Hopp, Cleveland, O.	Wm. L. Dewoody, Pine Bluff, Ark.	*Henry R. Gray*, Montreal, Can.
May 7, 1900	Richmond, Va.....	Jno. F. Patton, York, Pa.	James H. Beal, Scio, O.	Jno. W. Gayle, Frankfort, Ky.	E. A. Ruddiman, Nashville, Tenn.
Sept. 16, 1901	St. Louis, Mo.....	Henry M. Whelpley, St. Louis.	*Wm. M. Searby*, San Francisco.	George F. Payne, Atlanta, Ga.	*Wm. S. Thompson*, Washington, D. C.
Sept. 8, 1902	Philadelphia, Pa.....	Geo. F. Payne, Atlanta, Ga.	Wm. L. Cliffe, Philadelphia, Pa.	Eugene G. Eberle, Dallas, Texas.	Henry Willis, Quebec, Can.

LIST OF OFFICERS (Continued)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Aug. 3, 1903	Mackinac Island, Mich.....	Lewis C. Hopp, Cleveland, O.	*Wm. C. Alpers*, New York.	Albert M. Roehrig, Stapleton, N. Y.	Otto F. Claus, St. Louis, Mo.
Sept. 5, 1904	Kansas City, Mo.....	James H. Beal, Scio, O.	*Philip C. Candidus*, Mobile, Ala.	Wm. Mittelbach, Boonville, Mo.	Julius A. Koch, Pittsburgh, Pa.
Sept. 4, 1905	Atlantic City, N. J...	Jos. L. Lemberger, Lebanon, Pa.	*Chas. Holzhauer*, Newark, N. J.	Chas. A. Rapelye, Hartford, Conn.	Fabius C. Godbold, New Orleans, La.
Sept. 3, 1906	Indianapolis, Ind.....	*Leo Eliel*, South Bend, Ind.	Wm. Mittelbach, Boonville, Mo.	*C. S. N. Hallberg*, Chicago, Ill.	*Thomas P. Cook*, New York, N. Y.
Sept. 2, 1907	New York, N. Y.....	*Wm. M. Searby*, San Francisco, Cal.	*Oscar Oldberg*, Chicago, Ill.	Henry H. Rusby, New York, N. Y.	Oscar W. Bethea, Meridian, Miss.
Sept. 7, 1908	Hot Springs, Ark.....	*Oscar Oldberg*, Chicago, Ill.	Eugene G. Eberle, Dallas, Texas.	Wm. Mittelbach, Boonville, Mo.	James H. Beal, Scio, O.
Aug. 16, 1909	Los Angeles, Cal.....	Henry H. Rusby, Newark, N. J.	Clement B. Lowe, Philadelphia, Pa.	Chas. W. Johnson, Seattle, Wash.	Wm. B. Day, Chicago, Ill.
May 2, 1910	Richmond, Va.....	Eugene G. Eberle, Dallas, Texas.	Wm. B. Day, Chicago, Ill.	Otto F. Claus, St. Louis, Mo.	Leonard A. Seltzer, Detroit, Mich.
Aug. 14, 1911	Boston, Mass.....	John G. Godding, Boston, Mass.	W. Bodemann, Chicago, Ill.	Chas. M. Ford, Denver, Colo.	Ernest Berger, Tampa, Fla.
Aug. 19, 1912	Denver, Colo.....	William B. Day, Chicago, Ill.	Chas. M. Ford, Denver, Colo.	Caswell A. Mayo, New York, N. Y.	C. Herbert Packard, East Boston, Mass.
Aug. 18, 1913	Nashville, Tenn.....	George M. Beringer, Camden, N. J.	Franklin M. Apple, Philadelphia, Pa.	Wm. S. Richardson, Washington, D. C.	L. D. Havenhill, Lawrence, Kans.
Aug. 24, 1914	Detroit, Mich.....	Caswell A. Mayo, New York, N. Y.	L. D. Havenhill, Lawrence, Kans.	C. Herbert Packard, East Boston, Mass.	Charles Gietner, St. Louis, Mo.
Aug. 9, 1915	San Francisco, Cal....	*Wm. C. Alpers*, Cleveland, O.	C. H. LaWall, Philadelphia, Pa.	E. A. Ruddiman, Nashville, Tenn.	Linwood A. Brown, Lexington, Ky.
Aug. 27, 1916	Indianapolis, Ind.....	Fred. J. Wulling, Minneapolis, Minn.	Leonard A. Seltzer, Detroit, Mich.	Lucius E. Sayre, Lawrence, Kans.	Philip Asher, New Orleans, La.

HONORARY PRESIDENTS.

Philip C. Candidus, Mobile, Ala., 1907–08.
Samuel A. D. Sheppard, Boston, Mass., 1908–09.
Enno Sander, St. Louis, Mo., 1909–10.
Ewen McIntyre, New York, N. Y., 1910–11.
Henry Biroth, Chicago, Ill., 1911–12.
Thomas F. Main, New York, N. Y., 1912–13.
Albert B. Lyons, Detroit, Mich., 1913–14.
Geo. H. Schafer, Ft. Madison, Ia., 1914–15.
Fabius C. Godbold, New Orleans, La., 1915–16.
J. O. Burge, Nashville, Tenn., 1916–17.

TREASURERS.

Alfred B. Taylor, Philadelphia, 1852–54.
Samuel M. Colcord, Boston, 1854–56 and 1857–59.
James S. Aspinwall, New York, 1856–57.
Ashel Boyden, Boston, 1859–60.
Henry Haviland, New York, 1860–63.
J. Brown Baxley, Baltimore, Md., 1863–65.
Charles A. Tufts, Dover, N. H., 1865–86.
Samuel A. D. Sheppard, Boston, 1886–1908.
Henry M. Whelpley, St. Louis, 1908–17.

RECORDING SECRETARIES.

George D. Coggeshall, New York, 1852–53.
Edward Parrish, Philadelphia, 1853–54.
Edward S. Wayne, Cincinnati, 1854–55.
William J. M. Gordon, Cincinnati, 1855–59.
Charles Bullock, Philadelphia, 1859–60.
James T. Shinn, Philadelphia, 1860–62.
Peter W. Bedford, New York, 1862–63.
William Evans, Jr., Philadelphia, 1863–64.
Henry N. Rittenhouse, Philadelphia, 1864–65.

CORRESPONDING SECRETARIES.

William Procter, Jr., Philadelphia, 1852–53 and 1854–57.
William B. Chapman, Cincinnati, 1853–54.
Edward Parrish, Philadelphia, 1857–58.
Ambrose Smith, Philadelphia, 1858–59.
William Hegeman, New York, 1859–60.
Peter W. Bedford, New York, 1860–62 and 1863–65.
John M. Maisch, Philadelphia, 1862–63.

PERMANENT SECRETARIES.

John M. Maisch, Philadelphia, 1865–Sept., 1893.
Henry M. Whelpley, St. Louis (acting), August, 1893.
Joseph P. Remington, Philadelphia, 1893–94.
Chas. Caspari, Jr., Baltimore, 1894–96.

GENERAL SECRETARIES.

Chas. Caspari, Jr., 1896–1911.
James H. Beal, Scio, Ohio, 1911–14.
Wm. B. Day, Chicago, Ill., 1914–17.

LOCAL SECRETARIES.

For the meeting held in	
1867	*P. Wendover Bedford.*
1868	*Alfred B. Taylor.*
1869	*Henry W. Fuller.*
1870	*J. Faris Moore.*
1871	*William H. Crawford.*
1872	*Henry C. Gaylord.*
1873	Thomas H. Hazard.
1874	*Emil Scheffer.*
1875	*Samuel A. D. Sheppard.*
1876	Adolphus W. Miller.
1877	*Henry J. Rose.*
1878	*Jesse W. Rankin.*
1879	*Eli Lilly.*
1880	Charles F. Fish.
1881	*William T. Ford.*
1882	*Hiram E. Griffith.*
1883	Charles Becker.
1884	Henry C. Schranek.
1885	*George A. Kelly.*
1886	*William B. Blanding.*
1887	*George W. Voss.*
1888	James Vernor.
1889	Edward W. Runyon.
1890	*Charles E. Dohme.*
1891	*A. K. Finlay.*
1892	*H. M. Whitney.*
1893	*Henry Biroth.*
1894	W. G. Smith.
1895	Edm. L. Scholtz.
1896	*Joseph E. Morrison.*
1897	Edw. Shumpik.
1898	Henry P. Hynson.
1899	Lewis C. Hopp.
1900	T. Ashby Miller.
1901	H. M. Whelpley.
1902	William L. Cliffe.
1903	F. W. R. Perry.
1904	Joseph C. Wirthman.
1905	William C. Westcott.
1906	Frank H. Carter.
1907	*Thomas P. Cook.*
1908	Martin A. Eisele.
1909	Thomas W. Jones.
1910	T. Ashby Miller.
1911	C. Herbert Packard.
1912	Charles M. Ford.
1913	James O. Burge.
1914	Leonard A. Seltzer.
1915	John H. Dawson.
1916	*Chas. Holzhauer.*
1917	Francis E. Bibbins.

REPORTERS ON PROGRESS OF PHARMACY.

C. L. Diehl, Louisville, Ky., 1873–91 and 1895–1915. *Chas. Rice*, New York, N. Y., 1891–92. Henry Kraemer, Philadelphia, Pa., 1892–95. J. A. Koch, Pittsburgh, Pa., 1915–16. H. V. Arny, New York, N. Y., 1916–17.

PAST AND PRESENT OFFICERS OF THE SECTIONS.

SECTION ON COMMERCIAL INTERESTS.

	Chairman.	*Secretary.*
1887–88	*A. H. Hollister.*	*J. W. Colcord.*
1888–89	*A. H. Hollister.*	*J. W. Colcord.*
1889–90	*Leo Eliel.*	F. B. Kilmer.
1890–91	*Henry Canning.*	W. L. Dewoody.
1891–92	W. H. Torbert.	Arthur Bassett.

Past and Present Officers of the Sections (*Continued*).

	Chairman.	*Secretary.*
1892–93	W. H. Torbert.	Arthur Bassett.
1893–94	*Wiley Rogers.*	Jas. O. Burge.
1894–95	*Geo. J. Seabury.*	Jas. O. Burge.
1895–96	*Geo. J. Seabury.*	Clay W. Holmes.
1896–97	Lewis C. Hopp.	E. D'Avignon.
1897–98	Joseph Jacobs.	Jas. H. Bobbitt.
1898–99	Joseph Jacobs.	Jas. H. Bobbitt.
1899–00	James M. Good.	Charles A. Rapelye.
1900–01	Charles A. Rapelye.	F. W. Meissner.
1901–02	F. W. Meissner.	E. G. Eberle.
1902–03	Thomas V. Wooten.	Wm. C. Anderson.
1903–04	Wm. L. Dewoody.	Robert C. Reilly.
1904–05	Charles R. Sherman.	Robert C. Reilly.
1905–06	Henry P. Hynson.	Herman D. Kniseley.
1906–07	Herman D. Kniseley.	Charles H. Avery.
1907–08	Jacob Diner.	George O. Young.
1908–09	Harry B. Mason.	Erich H. Ladish.
1909–10	Waldo M. Bowman.	G. H. P. Lichthardt.
1910–11	Franklin M. Apple.	Benj. E. Pritchard.
1911–12	Ernest Berger.	D. W. Ramsaur.
1912–13	Autumn V. Pease.	William R. White.
1913–14	C. G. Lindvall, and H. B. Mason.	Grant W. Stevens.
1914–15	E. H. Thiesing.	David Stolz.
1915–16	R. S. Lehmann.	J. C. McGee.
1916–17	P. Henry Utech.	Robt. P. Fischelis.

Section on Scientific Papers.

	Chairman.	*Secretary.*
1887–88	*T. Roberts Baker.*	A. B. Lyons.
1888–89	*Emlen Painter.*	H. M. Whelpley.
1889–90	Henry Whelpley.	C. F. Dare.
1890–91	E. L. Patch.	*C. S. N. Hallberg.*
1891–92	*C. S. N. Hallberg.*	H. W. Snow.
1892–93	C. T. P. Fennel.	F. G. Ryan.
1893–94	L. E. Sayre.	C. M. Ford.
1894–95	A. R. L. Dohme.	George B. Kauffman.
1895–96	S. P. Sadtler.	*W. C. Alpers.*
1896–97	*W. C. Alpers.*	V. Coblentz.
1897–98	Edward Kremers.	A. B. Lyons.
1898–99	Henry H. Rusby.	H. V. Arny.
1899–00	Frank G. Ryan.	Caswell A. Mayo.
1900–01	*Oscar Oldberg.*	Lyman F. Kebler.
1901–02	Lyman F. Kebler.	Jos. W. England.
1902–03	*J. O. Schlotterbeck.*	Jos. W. England.
1903–04	William A. Puckner.	Eustace H. Gane.
1904–05	Eustace H. Gane.	Charles E. Caspari.
1905–06	Charles E. Caspari.	Daniel Base.
1906–07	Reid Hunt.	Virgil Coblentz.
1907–08	Virgil Coblentz.	Chas. E. Vanderkleed.
1908–09	Charles E. Vanderkleed.	*Martin I. Wilbert.*
1909–10	*Martin I. Wilbert.*	Albert H. Clark.
1910–11	Albert H. Clark.	Wm. O. Richtmann.
1911–12	W. O. Richtmann.	Charles H. LaWall.
1912–13	Frank R. Eldred.	Freeman P. Stroup.
1913–14	Edsel A. Ruddiman.	Wilbur L. Scoville.
1914–15	H. Engelhardt.	William Mansfield.
1915–16	W. L. Scoville.	E. L. Newcomb.
1916–17	J. L. Turner.	W. W. Stockberger.

PAST AND PRESENT OFFICERS OF THE SECTIONS (*Continued*).

SECTION ON PHARMACEUTICAL EDUCATION.

	Chairman.	*Secretary.*
1887–88	*R. F. Bryant.*	W. P. DeForest.
1888–89	C. W. Day.	J. N. Hurty.

SECTION ON PHARMACEUTICAL LEGISLATION.

	Chairman.	*Secretary.*
1887–88	*John F. Judge.*	H. M. Whelpley.
1888–89	*P. W. Bedford.*	L. E. Sayre.

SECTION ON PHARMACEUTICAL EDUCATION AND LEGISLATION.

	Chairman.	*Secretary.*
1889–90	*P. W. Bedford.*	A. B. Stevens.
1890–91	*William Simon.*	L. C. Hogan.
1891–92	A. B. Stevens.	L. C. Hogan.
1892–93	R. G. Eccles.	L. C. Hogan.
1893–94	R. G. Eccles.	L. C. Hogan.
1894–95	James M. Good.	*C. S. N. Hallberg.*
1895–96	*C. S. N. Hallberg.*	Jas. H. Beal.
1896–97	*C. S. N. Hallberg.*	Jas. H. Beal.
1897–98	James H. Beal.	H. Gordon Webster.
1898–99	A. B. Lyons.	C. B. Lowe.
1899–00	C. B. Lowe.	J. A. Koch.
1900–01	C. B. Lowe.	J. A. Koch.
1901–02	E. G. Eberle.	J. W. T. Knox.
1902–03	J. W. T. Knox.	Harry B. Mason.
1903–04	Harry B. Mason.	Wm. L. Cliffe.
1904—05	Harry B. Mason.	Wm. L. Cliffe.
1905–06	*Oscar Oldberg.*	Jos. W. England.
1906–07	*Oscar Oldberg.*	Jos. W. England.
1907–08	Jos. W. England.	Chas. H. LaWall.
1908–09	Jos. W. England.	Chas. H. LaWall.
1909–10	Charles H. LaWall.	Chas. W. Johnson.
1910–11	Charles W. Johnson.	W. J. Teeters.
1911–12	John C. Wallace.	W. J. Teeters.
1912–13	Wilber J. Teeters.	Frank H. Freericks.
1913–14	Hugh Craig.	Frank H. Freericks.
1914–15	F. H. Freericks.	R. A. Kuever.
1915–16	F. H. Freericks.	R. A. Kuever.
1916–17	R. A. Kuever.	C. B. Jordan.

SECTION ON PRACTICAL PHARMACY AND DISPENSING.

	Chairman.	*Secretary.*
1900–01	H. P. Hynson.	F. W. E. Stedem.
1901–02	F. W. E. Stedem.	William Kaemmerer.
1902–03	Geo. M. Beringer.	*William H. Burke.*
1903–04	*William H. Burke.*	E. A. Ruddiman.
1904–05	Charles A. Rapelye.	Wm. C. Kirchgessner.
1905–06	*Wm. C. Alpers.*	H. A. Brown Dunning.
1906–07	H. A. Brown Dunning.	*Joseph Weinstein.*
1907–08	Franklin M. Apple.	*Joseph Weinstein.*
1908–09	Leonard A. Seltzer.	E. Fullerton Cook.
1909–10	Otto Raubenheimer.	Erich H. Ladish.
1910–11	Louis Saalbach.	P. Henry Utech.
1911–12	P. Henry Utech.	J. Leon Lascoff.
1912–13	J. Leon Lascoff.	F. W. Nitardy.
1913–14	F. W. Nitardy.	Cornelius Osseward.

Past and Present Officers of the Sections (*Concluded*).

	Chairman.	*Secretary.*
1914–15	Cornelius Osseward.	I. A. Becker.
1915–16	*Joseph Weinstein.*	H. B. SeCheverell.
1916–17	W. H. Glover.	David Stolz.

Section on Historical Pharmacy.

	Chairman.	*Secretary.*
1904–05	*Albert E. Ebert.*	Caswell A. Mayo.
1905–06	John F. Hancock.	*C. S. N. Hallberg.*
1906–07	*Ewen McIntyre.*	Eugene G. Eberle.
1907–08	Edward V. Howell.	Eugene G. Eberle.
1908–09	*John B. Bond.*	Eugene G. Eberle.
1909–10	Eugene G. Eberle.	John A. Dunn.
1910–11	Joseph L. Lemberger.	Otto Raubenheimer.
1911–12	Otto Raubenheimer.	Caswell A. Mayo.
1912–13	John G. Godding.	*Frederick T. Gordon.*
1913–14	*Wm. C. Alpers.*	*Frederick T. Gordon.*
1914–15	*Frederick T. Gordon.*	A. H. Clark.
1915–16	*Charles Holzhauer.*	G. G. Marshall.
1916–17	W. L. DuBois.	L. E. Sayre.

Section on Pharmacopœias and Formularies.

	Chairman.	*Secretary.*
1912–13	L. D. Havenhill.	E. Fullerton Cook.
1913–14	E. Fullerton Cook.	R. H. Needham.

Women's Section.

	Chairman.	*Secretary.*
1912–14	Mrs. John G. Godding.	Miss Anna G. Bagley.
1914–15	Mrs. John Culley.	Miss Anna G. Bagley.
1915–16	Mrs. G. D. Timmons.	Miss Anna G. Bagley.
1916–17	Mrs. E. A. Ruddiman.	Mrs. Jean McKee Kenaston.

OFFICERS OF THE COUNCIL SINCE ITS FIRST ORGANIZATION.

	Chairman.	*Vice-Chairman.*	*Secretary.*
1880–81	*Jos. P. Remington.*	*Joseph Roberts.*	*George W. Kennedy.*
1881–83	" " "	*Wm. J. M. Gordon.*	" " "
1883–84	" " "	*C. Lewis Diehl.*	" " "
1884–85	" " "	*John A. Dadd.*	" " "
1885–86	" " "	*C. Lewis Diehl.*	" " "
1886–87	*Wm. S. Thompson.*	*H. J. Menninger.*	" " "
1887–88	Wm. H. Rogers.	*Karl Simmon.*	" " "
1888–89	Jas. M. Good.	*Emlen Painter.*	" " "
1889–90	" " "	*Wm. S. Thompson.*	" " "

OFFICERS OF THE COUNCIL SINCE ITS FIRST ORGANIZATION (*Concluded*).

	Chairman.	*Vice-Chairman.*	*Secretary.*
1890–92	Jas. M. Good.	*Wm. S. Thompson.*	*George W. Kennedy.*
1892–94	" " "	*H. M. Whitney.*	" " "
1894–95	*Wm. S. Thompson.*	" " "	" " "
1895–96	" " "	*Wm. C. Alpers.*	" " "
1896–1901	" " "	Jas. M. Good.	" " "
1901–02	*A. B. Prescott.*	*Chas. E. Dohme.*	" " "
1902–03	James H. Beal.	Lewis C. Hopp.	Henry M. Whelpley.
1903–04	" " "	*Leo Eliel.*	" " "
1904–05	" " "	Jos. L. Lemberger.	" " "
1905–06	" " "	*Wm. C. Alpers.*	" " "
1906–08	" " "	Albert M. Roehrig.	" " "
1908–09	*Jos. P. Remington.*	*Wm. S. Searby.*	Joseph W. England.
1909–10	Fabius C. Godbold.	Julius A. Koch.	" " "
1910–11	James H. Beal.	Henry H. Rusby.	" " "
1911–12	Eugene G. Eberle.	James M. Good.	" " "
1912–13	" " "	Fabius C. Godbold.	" " "
1913–16	" " "	J. C. Godding.	" " "
1916–17	Lewis C. Hopp.	S. L. Hilton.	" " "

Constitution and By-Laws

OF THE

American Pharmaceutical Association

(Revised to September 1, 1917, inclusive.)

CONSTITUTION

Article I. This Association shall be called the "American Pharmaceutical Association." Its aim shall be to unite the educated and reputable Pharmacists and Druggists of America in the following objects:

1. To improve and regulate the drug market by preventing the importation of inferior, adulterated, or deteriorated drugs and by detecting and exposing home adulterations.

2. To encourage such proper relations among Druggists, Pharmacists, Physicians and the people at large, as may promote the public welfare, and tend to mutual strength and advantage.

3. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, encouraging home production and manufacture in the several departments of the drug business.

4. To regulate the system of apprenticeship and employment, so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing, and selling medicines.

5. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

6. To uphold standards of authority in the Education, Theory and Practice of Pharmacy.

7. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge with a view to the highest good and greatest protection to the public.

Article II. This Association shall consist of active, life, and honorary members, and shall hold its meetings annually.

Article III. The officers of the Association shall be a President, three Vice-Presidents, a General Secretary, a Treasurer, and a Reporter on the Progress of Pharmacy, all of whom shall be elected annually; also a Local Secretary to be elected by the council. They shall hold office until an election of successors.

ARTICLE IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated, to the Association, may be invested by the Treasurer in United States Government, State, Municipal, County or other securities acceptable as security for postal savings deposits, the interest of which for any current year only may be used by the Association for its expenses.

ARTICLE V. Every proposition to alter or amend this Constitution shall be printed in the JOURNAL at least thrity days prior to the annual meeting, shall be read at the first general session of the annual meeting, and shall be balloted upon at a subsequent general session, when, upon receiving the affirmative votes of two-thirds of the members present, it shall become a part of the Constitution. Any proposition to amend the Constitution for the purpose of permitting the expenditure of the permanent invested funds of the Association, shall require a majority of seven-eighths for its passage.

BY-LAWS

(Revised to September 1, 1917, inclusive.)

CHAPTER I.

Of the Election of Officers.

ARTICLE I. A Nominating Committee shall be annually chosen, whose duty it shall be annually, at the meeting, to select candidates for the offices of President, three Vice-Presidents and three members of the Council.

ARTICLE II. The Nominating Committee shall submit the names of three persons as candidates for each of the Offices of President, First Vice-President, Second Vice-President, Third Vice-President and three members of the Council. These names are to be submitted by the General Secretary by mail to every member of the Association within three months after he receives them, together with a request that the member indicate his preference on a ballot enclosed for that purpose, and return the same by mail within one month after its receipt.

ARTICLE III. The ballots received as indicated in the preceding article are to be sent by the General Secretary to a Board of Canvassers, composed of three members to be appointed by the President, who shall count as votes in the annual election only the votes of those members whose dues have been paid for the current year, and who in turn shall certify to the General Secretary the result of the election, after which the latter shall be published in the JOURNAL of the Association.

ARTICLE IV. The officers thus elected by a plurality of the votes cast shall be installed at the final general session of the next annual meeting.

ARTICLE V. The Honorary President, Reporter on the Progress of Pharmacy, the Treasurer and the General Secretary shall be elected annually by the Council.

CHAPTER II.

Of the President and Vice-Presidents.

ARTICLE I. The president shall preside at all general sessions of the Association, except those of the special Sections, as hereinafter provided. In the event of his absence or inability to serve, one of the Vice-Presidents, or in the absence of all, a President *pro tempore*, shall perform the duties of the President.

ARTICLE II. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore*.

ARTICLE III. At the sessions the President shall take the chair at the proper time; announce all business; receive all proper motions, resolutions, reports and communications, and order the vote upon all proper questions at the proper time.

ARTICLE IV. In all balloting and on questions upon which the ayes and nays are taken, the President is required to vote, but his name shall be called last; in other cases he shall not vote, unless the members be equally divided, or unless his vote, if given to the minority, will make the decision equal; and in case of such equal division, the motion is lost.

ARTICLE V. He shall enforce order and decorum; it is his duty to hear all that is spoken in debate, and in case of personality and impropriety he shall promptly call the speaker to order. He shall decide all questions of order, subject to the right of appeal, unless in case where he prefers to submit the matter to the members; decide promptly who is to speak when two or more members rise at the same moment, and be careful to see that business is brought forward in proper order.

ARTICLE VI. He shall have the right to call a member to the chair, in order that he may take the floor in debate. He shall see that the Constitution and By-Laws are properly enforced.

ARTICLE VII. He shall appoint all committees not provided for in the By-Laws or otherwise directed by the Association. He shall announce the names of the appointees on such committees, as far as possible, at the time of his installation or within thirty days thereafter.

ARTICLE VIII. He shall sign the certificates of membership. He shall obey the instructions of the Association, and authenticate by his signature, when necessary, its proceedings.

ARTICLE IX. He shall present at each annual meeting an address, embodying general scientific facts and events of the year, or discuss such scientific questions as may to him seem suitable to the occasion.

CHAPTER III.

Of the General Secretary.

ARTICLE I. The General Secretary shall be elected annually and shall receive from the Treasurer an annual salary not to exceed $1200, and the amount of his

expenses incident to the meeting, in addition to his salary. He shall give bond for the proper disposition of the funds of the Association which may come into his hands, in such amount as may be prescribed by the Council.

ARTICLE II. He shall keep fair and correct minutes of the proceedings of the general session, and carefully preserve, on file, all reports, essays and papers of every description presented to the association, and shall be charged with the necessary foreign and scientific correspondence, and with the distribution of the Report on the Progress of Pharmacy under the direction of the Council.

ARTICLE III. He shall read all papers handed him by the President for that purpose, shall call and record the ayes and nays, whenever they are required to be called, shall notify the President, Local Secretary and the chairman of every standing and special committee of his election or appointment, giving each a statement of his duties and such other information as may be of service.

CHAPTER IV.

Of the Local Secretary.

ARTICLE I. The Local Secretary shall assist the General Secretary in his duties; shall co-operate with the Council and any Local Committee in making arrangements for the annual meeting; shall correspond with the chairman of the several committees, and with other members in advance of the meeting, for the promotion of its objects, and shall have the custody of specimens, papers and apparatus destined for use or exhibition at the meetings.

ARTICLE II. An exhibition of objects interesting to pharmacists may be held each year, should the Council so determine, under the direction of the Local Secretary and the Section on Commercial Interests.

CHAPTER V.

Of the Treasurer.

ARTICLE I. The Treasurer shall collect and take charge of the funds of the Association, and shall hold, sign, and issue the certificates of membership.

ARTICLE II. He shall pay no money except on the order of the General Secretary, accompanied by the proper vouchers.

ARTICLE III. He shall report to the Council, previous to each annual meeting, the names of such members as have failed to pay their annual dues for three years.

ARTICLE IV. He shall present a statement of his accounts at each annual meeting of the Council, that they may be audited; he shall receive an annual salary not to exceed $1,000, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE V. The Treasurer, in order that he may qualify for the office to which he has been elected, shall file a good and sufficient bond or bonds for the amount of $15,000 with the Chairman of the Council for the faithful performance of his

duties as Treasurer, this bond or bonds to be signed and executed by a Trust Company acceptable to the Council.

CHAPTER VI.

Of the Reporter on the Progress of Pharmacy.

ARTICLE I. The Reporter on the Progress of Pharmacy shall be elected annually, and shall receive from the Treasurer for his services an annual salary not to exceed $1,200.

ARTICLE II. All journals and volumes received in exchange for the Report on the Progress of Pharmacy by the General Secretary, and such other journals as shall be deemed necessary, shall be sent to him by that officer for use in the compilation of his report; for all of which he shall be held responsible until returned to the General Secretary for preservation.

ARTICLE III. From these and other available sources, he shall prepare a comprehensive report on the improvements and discoveries in Pharmacy, Chemistry and Materia Medica, and the collateral branches of knowledge; together with such data as will furnish an epitome of the progress and changes in the science and practice of Pharmacy, and of its votaries, at home and abroad.

ARTICLE IV. The Report on the Progress of Pharmacy shall be edited, published and distributed under rules and regulations approved by the Council. It shall be issued as a yearly volume, covering each fiscal year of the Association.

ARTICLE V. In case of the illness or other inability of the Reporter to carry on the work of the report, the General Secretary and the Chairman of the Council shall be required to make the best arrangements they can command to continue the work to its completion.

CHAPTER VII.

Of the Council.

ARTICLE I, *Section 1.* The business of the Association which is not of a scientific character shall be in charge of a Council, which is empowered to transact business for the Association between the times of meeting, to reduce any appropriations that have been made, whenever in their judgment the current receipts are not sufficient to allow the expenditure, and to perform such duties as may from time to time be committed to them by the Association; their acts, however, being subject to revision by the Association.

Section 2. Any member of the association may attend the meetings of the Council, and may, by permission of the presiding officer, be permitted to speak on any subject under discussion.

ARTICLE II. The Council shall consist of *ex-officio* members; one member from each local branch of this Association and nine other members, selected from

such members as have had at least three years' membership in this Association, shall be elected by ballot by the Association in the following order: Three of them to serve for one year, three for two years, three for three years. At each subsequent annual meeting, three members shall be elected to take the place of those whose terms will then expire, to serve for the term of three years.

ARTICLE III. The President, Vice-Presidents, General Secretary, Local Secretary, Treasurer, Reporter on the Progress of Pharmacy, Editor-in-chief of the JOURNAL, the Chairmen of the Sections of the Association, the Secretary of the Council, and the Historian of the Association shall be *ex-officio* members of the Council.

ARTICLE IV. Vacancies which may occur in the Council shall be filled for the unexpired term or terms by the Association at its next annual meeting.

ARTICLE V. The officers of the Council shall consist of a Chairman, Vice-Chairman, and a Secretary, to be elected by ballot annually by the Council.

ARTICLE VI. The Council shall be charged with the examination of the credentials of delegates, and the transaction of unfinished business of the Association from one annual meeting to another, and with collecting, arranging, and expediting the business of the Association during the sessions of the annual meeting.

ARTICLE VII. There shall be elected annually by ballot, by the Council, two standing committees of the Council—a Committee of Publication and a Committee on Finance—to whom shall be referred such duties as are appropriate to their respective functions, as the Council shall direct; they shall report annually to the Council, and at such other times as the Council may direct.

Whenever deemed advisable by the Council, it shall after the publication of each edition of the National Formulary appoint a committee of fifteen members from the general membership of the Association, which committee shall have charge of the revision of the Formulary. This committee shall report annually, or as often as required, to the Council, and shall continue to serve until the edition for which it was appointed has been completed. Vacancies occurring in this committee shall be filled by the Council as quickly as is expedient.

ARTICLE VIII, *Section 1.* The Council shall have charge of the revision of the roll of members, and the editing, publication and distribution of all the publications of the Association.

Section 2. The Secretary of the Council shall submit to the Council the names of the candidates who have been proposed for membership, when a majority vote shall be sufficient to elect them.

ARTICLE IX. The Council shall furnish to each member of the Association, not in arrears, one copy of the Report on the Progress of Pharmacy, which publication shall contain, in addition to the report, a list of the officers and committees, prefatory matter, constitution and by-laws, general rules, roll of members, list of members, and such other matter as may be deemed desirable by the Council. It shall fix, also, the price for which copies of the Report may be sold.

ARTICLE X. The Council shall issue a monthly journal, beginning in January, 1912, and thereafter, under rules and regulations to be adopted by the Council, and shall furnish copies of such publication to each member of the Association not in arrears for subscription. The publication shall contain editorials, original articles, the proceedings of the annual meetings, of the Council, and of the branches, and such other matter as may be deemed desirable by the Council.

CHAPTER VIII.

Of Membership.

ARTICLE I. Every pharmacist and druggist of good moral and professional standing whether in business on his own account, retired from business, or employed by another, and those teachers of Pharmacy, Chemistry and Botany who may be especially interested in Pharmacy and Materia Medica, also editors and publishers of pharmaceutical journals, who, after duly considering the objects of the Association and the obligations of the Constitution and By-Laws, subscribe to them, are eligible to membership; provided that any person whose name has been dropped from the roll of members for non-payment of dues may be readmitted after having again made application in regular form, the application being accompanied by the usual fee; or he may be readmitted, without such application, on payment of all back dues; in the latter case his membership shall date from the time when he first joined the Association, as previously printed in the Roll of Members, and notice of such action shall be inserted in the addendum to the Treasurer's report.

ARTICLE II. Every application for membership shall require the endorsement of two members of the Association in good standing, and each applicant must receive the affirmative vote of a majority of the members of the Council for election, after which his membership shall be completed by his signing the Constitution and By-Laws and paying the annual dues for the current year. Any newly elected member, upon the payment of annual dues for the year in which he is elected, shall be entitled to the annual volume of the Report on the Progress of Pharmacy and such other publications of the Association as are distributed to its members free of charge during the year. Any application for membership made during the fiscal year (the calendar year shall be the fiscal year of the Association) shall apply to the current fiscal year; except between June and January, when, if desired, it can be made to apply to the next fiscal year, if so stated on the application. The publications will be sent for the fiscal year in which the dues and subscription are credited.

The price for the Report on the Progress of Pharmacy to non-members shall be fixed by the Council. The subscription price for the JOURNAL of the Association shall be four dollars per annum to members and non-members alike. The subscription of the JOURNAL must be separate and distinct from the annual dues, although both may be paid at one and the same time.

ARTICLE III. Every member shall pay *in advance* to the Treasurer the sum of four dollars as annual dues, and by neglecting to pay said contribution for *six successive months*, may be dropped from the roll of members. If the annual dues

(four dollars) and the annual subscription to the JOURNAL (four dollars) be paid at one and the same time, a reduction of three dollars shall be allowed.

ARTICLE IV. Any member of the Association who shall pay to the Treasurer the sum of $100.00 during the first year of his connection therewith, and also any member not in arrears, who after ten years shall pay the sum of $75.00, or after fifteen years the sum of $50.00, or after twenty years the sum of $40.00, or after twenty-five years the sum of $25.00, and any member who may have paid annual dues for thirty-seven consecutive years, shall become a life-member, and shall be exempt from all future annual contributions.

ARTICLE V. All local and state organizations of Pharmacists shall be entitled to three delegates as their representatives in the annual meeting, who, if present, become members of the Association on signing the Constitution and paying the annual contribution for the current year. Provided, that the provisions of this article shall not be so construed as to reinstate any member whose name shall have been dropped from the rolls for non-payment of dues, nor shall any one who has been expelled from the Association be received as a delegate. All credentials shall be sent to the General Secretary at least two weeks in advance of the annual meeting.

ARTICLE VI. Members shall be entitled, on the payment of Three Dollars or of Five Dollars, to receive from the Treasurer, respectively, a paper or parchment certificate of membership signed by the President, one Vice-President, the General Secretary, and the Treasurer.

ARTICLE VII. Resignations of membership shall be made in writing to the General Secretary or Treasurer, but no resignation shall be accepted from any one who is in arrears to the Treasury.

All resignations shall be acknowledged in writing by the officer who receives them, and shall be reported to the Council.

ARTICLE VIII. Any member may be expelled for improper conduct, or the violation of the Constitution, By-Laws, or Ethics, adopted by the Association, but no person shall be expelled unless he shall receive for expulsion two-thirds of all the votes cast at a general session.

ARTICLE IX. Pharmacists, chemists, and other scientific men who may be thought worthy the distinction, may be elected honorary members. They shall not, however, be required to contribute to the funds, nor shall they be eligible to hold office or vote at the meetings.

CHAPTER IX.

Of Meetings and Sections.

ARTICLE I. The meetings shall be held annually: Provided that in case of failure of this, from any cause, the duty of calling the Association together shall devolve upon the President, or one of the Vice-Presidents, with the advice and consent of the Council.

ARTICLE II. To expedite and render more efficient the work of the Association, the following Sections are provided:

1. Scientific Section, with four subdivisions: (*a*) Chemistry, (*b*) Botany and Pharmacognosy, (*c*) Biologic Assays, (*d*) Bacteriology.

2. Section on Commercial Interests.

3. Section on Practical Pharmacy and Dispensing.

4. Section on Pharmaceutical Legislation and Education.

5. Section on Historical Pharmacy.

6. Women's Section.

Upon the approval of the Council additional Sections may be organized from time to time as necessitated. Each Section, through its officers, shall solicit papers and propose suitable subjects for discussion at the annual meeting, arrange the business of the Section in advance, and perform such duties as may be referred to it. It shall make reports to the Council or Association if requested. The conduct of the work of each Section shall be under by-laws, rules and regulations approved by the Council. All committees proposed or appointed by the Sections shall be subject to the approval of the Council.

ARTICLE III. The business of the Association shall be arranged so that the labors of each Section shall be considered only at the session or sessions to which they are especially assigned.

ARTICLE IV. The first, second and last sessions of the annual meeting shall be devoted to the general business of the Association, and sufficient time shall be assigned to the Association at the beginning of all other sessions to read the minutes of the Council, act on the report of Council or membership, and receive propositions for amendments to the By-Laws.

ARTICLE V. A Chairman and Secretary shall be elected by ballot by each Section (except the Scientific Section which elects its officers in accord with the by-laws of said Scientific Section) to serve at the sessions of said Section. The minutes of each session, together with all documents and papers which belong to each Section, must be placed as soon as possible in the hands of the General Secretary for publication and safe-keeping.

ARTICLE VI. The Chairman of each Section (except the Scientific Section whose officers act in accord with the by-laws of said Scientific Section) shall preside at each of its sessions, and shall prepare a short address treating upon the subjects connected with his section, to be read before the Section at the annual meeting.

ARTICLE VII. The officers of the Section on Commercial Interests shall be charged with the work of arranging in advance the business to come before the Section at the next annual meeting; shall propose each year a subject for discussion at the meetings of the State Associations, and at the following annual meeting of this Association shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE VIII. The Chairman of the Section on Practical Pharmacy and Dispensing shall appoint a committee of three on pharmacopœias and formularies to co-operate in the work of the Section by obtaining papers on the subjects of pharmacopœias and formularies and discussions thereon. The officers shall arrange in advance of the meeting the business to come before the Section.

ARTICLE IX. The officers of the Section on Pharmaceutical Legislation and Education shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines; shall report at each stated meeting of the Association what legislation on pharmaceutical subjects has occurred during the year; shall arrange the business of the Section in advance of its sessions, propose suitable subjects for discussion, and shall attend to such duties as may be delegated to them by the Section; shall propose each year a subject for discussion at the meetings of the State Associations, and, at the following annual meeting of this Association, shall present a report of the section of the State Associations upon the subject proposed.

ARTICLE X. The officers of the Section on Historical Pharmacy shall arrange the business of the Section and shall present annually matters of special historical interest in pharmacy; and shall also secure the collection of letters, papers, etc., written by members of the Association, which when so collected shall remain in the custody of the Section and be available for reference to any one interested.

ARTICLE XI. The Women's Section shall consist of women who are regular members in good standing in the American Pharmaceutical Association, and the women of the families of regular members in good standing, united for the purpose of promoting the aims of the American Pharmaceutical Association and for advancing the interests of women engaged in pharmaceutical pursuits.

ARTICLE XII. The order of business at the first session of each annual meeting shall be as follows:

Section 1. Promptly at the time named in the notice issued for the meeting, the President, or, in his absence, one of the Vice-Presidents, or, in their absence, a President *pro empore*, shall officiate.

Section 2. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore*, who shall perform the duties of the General Secretary until his arrival.

Section 3. Nineteen members shall constitute a quorum for the transaction of business.

Section 4. The President's Address may then be read, after which the Council shall report the list of properly accredited delegates.

Section 5. Reports of Committees shall be presented, read by their titles, synopsis, or in full, and laid on the table for future consideration.

Section 6. An abstract of the minutes of the Council shall be read at the annual meeting of the Association, and the acts of the Council shall be approved, amended or revised so as to be acceptable to the Association. At any general session, a member may request further information upon any matter reported on by the Council.

Section 7. The President shall call the roll of States, the Territories, District of Columbia, and the Provinces of Canada, requesting the members present from each State or Territory to appoint two members, the persons so selected to act as a Committee to nominate officers for the Association and members of the Council for the ensuing three years; in addition to which the President shall appoint five members from the Association-at-large to act with the Committee. Delegates who are not members must complete their membership before they are eligible to serve on the Nominating Committee.

Section 8. Incidental business.

ARTICLE XIII. The order of business at the second general session at each annual meeting shall be as follows:

Section 1. The President shall call the Association to order.

Section 2. The Secretary shall read the minutes of the preceding session, which may be amended, if necessary, and shall then be approved.

Section 3. The report of the Committee on Nominations shall be read.

Section 4. Reading of the Minutes of the Council.

Section 5. Reading of the Reports of the Treasurer and General Secretary.

Section 6. Reports of Standing Committees shall be read.

Section 7. Reports of Special Committees shall be read.

Section 8. Incidental business.

Section 9. Adjournment subject to the call of the President.

ARTICLE XIV. The order of business for the sessions of the Sections shall be determined by each Section for itself.

ARTICLE XV. No money shall be appropriated from the Treasury by any of the Sections.

ARTICLE XVI. At the last general session of the Association the newly elected officers of the Association shall take their respective places.

ARTICLE XVII. The Council may arrange for such social sessions, to be held after the adjournment of the last general session, as it may deem expedient, but no business of the Association can be transacted at these social sessions.

CHAPTER X.

Of Committees.

ARTICLE I. There shall be appointed or elected standing committees as follows: A Committee on United States Pharmacopœia, a Committee on Transportation, and a Committee on Resolutions, each to consist of ten members; a Committee on Pharmaceutical Syllabus, to consist of seven members; a Committee on Time and Place of Meeting; a Committee on Ebert Prize, and a Committee on General Prizes, each to consist of three members; and a Committee on Program.

ARTICLE II. Any person desiring to submit a paper to the Association shall present to the Chairman of the particular Section to which it refers at least ten

days prior to the meeting, an abstract of said paper, indicative of its contents, and consisting of not less than fifty nor more than two hundred words.

This abstract shall be printed as a part of the program. The paper itself must be submitted to the officers of the Section previous to the first session. Not more than ten minutes shall be allowed for the presentation of any paper, unless by unanimous consent of the Section. This does not apply to the Scientific Section, which handles its papers in accord with the by-laws of said Scientific Section.

All papers presented to the Association and its branches shall become the property of the Association, with the understanding that they are not to be published in any other publications than those of the Association, except by the consent of the Committee on Publication.

ARTICLE III. The Committee on the Ebert Prize, which shall be appointed by the Chairman of the Scientific Section, shall, at the next annual meeting after the one at which essays are presented, determine which, if any of them, has met the requirements of the founder of the prize. In all respects it shall be governed by the stipulations expressed by the donor.

ARTICLE IV. The Committee on General Prizes, which shall be appointed by the President, shall, at the next annual meeting after the one at which the papers are presented, determine which, if any of them, are worthy of prizes, and decide upon the relative merits of such papers as are deemed worthy.

ARTICLE V. The Committee on the United States Pharmacopœia shall be appointed by the President of the Association as follows: One member to be appointed for ten years and one for nine, eight, seven, six, five, four, three, two and one years, respectively, each vacancy occurring by expiration of term to be filled by a new appointment for ten years. The Committee shall elect its own Chairman annually. It shall collect statistics regarding the frequency with which official and non-official remedies are used in legitimate practice, and shall endeavor to ascertain the general wishes and requirements of the profession throughout the country in regard to any desired changes or improvements in the Pharmacopœia. It shall also note errors of any kind found in the U. S. Pharmacopœia so as to facilitate and aid the work of the National Committee of Revision of the U. S. P.

ARTICLE VI. The Committee on Transportation, which shall be elected by the Council, shall consist of one member each from the cities of Boston, New York, Chicago, St. Louis, Cincinnati, New Orleans, Atlanta, St. Paul or Minneapolis, Denver, Baltimore, Cleveland and San Francisco, and in conjunction with the General Secretary and the Local Secretary, who shall be members of the Committee, shall arrange for transportation from the different sections of the United States and Canada to the place of meeting and return. The Council shall annually elect the Chairman of this Committee.

ARTICLE VII. The Committee on Pharmaceutical Syllabus shall be appointed by the President of the Association as follows: One member shall be appointed for seven years, and one for six, five, four, three, two and one years, respectively; each vacancy occurring from expiration of term shall be filled for a term of seven

years; other vacancies shall be filled at the annual meetings of the Association for the unexpired terms. This committee shall report to the Association through the Section on Pharmaceutical Legislation and Education, shall be members of the National Committee on Pharmaceutical Syllabus and shall recommend to the Association its proportionate share of the current expenses.

ARTICLE VIII. The reports of all committees of the Association must be sent to the General Secretary in time for presentation at the first general session of the annual meeting of the Association.

ARTICLE IX. The Committee on Resolutions shall be appointed at the first session of the annual meeting, five members by the President of the Association and five by the Chairman of the Council. The Committee shall hold open sessions for the consideration of matters referred to it either by the Association, any Section or by the Council, and to obtain the opinion of the members thereon and report to the referring bodies.

ARTICLE X. The Committee on Program shall consist of the Local Secretary, the General Secretary and the Secretary of the Council. It shall be the duty of the committee to prepare and submit to the Council the program for the annual meeting so that same can be published in the JOURNAL at least two months in advance of the annual meeting.

CHAPTER XI.

Rules of Order and Debate.

ARTICLE I. The ordinary rules of parliamentary bodies shall be enforced by the presiding officer, from whose decision, however, appeals may be taken, if required by two members, and the meeting shall thereupon decide without debate.

ARTICLE II. When a question is regularly before the assembly and under discussion, no motion shall be received but to adjourn, to lay on the table, for the previous question, to postpone to a certain day, to commit or amend, to postpone indefinitely; which several motions have precedence in the order named. A motion to adjourn shall be decided without debate.

ARTICLE III. No member may speak twice on the same subject, except by permission, until every member wishing to speak has spoken.

ARTICLE IV. On the call of any two members, the ayes and nays shall be ordered, when every member shall vote, unless excused by a majority of those present, and the names and manner of voting shall be entered on the minutes.

ARTICLE V. On all points of order not covered in these By-Laws, the Association shall be governed by the established usages in all assemblies governed by parliamentary rules.

CHAPTER XII.

Local Branches.

ARTICLE I. Local Branches of this Association may be formed whenever it may appear that fifteen members of this Association in good standing, will par-

ticipate, provided that no more than one such branch shall be formed in any one state, province, district or territory unless such branches shall be formed at a point distant one hundred miles or more from any branch already established in the same state, province, district or territory.

ARTICLE II. All active or voting members of local branches must be members of this Association in good standing.

ARTICLE III. The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it. And no local branch shall enact any article of constitution or by-law to conflict with the Constitution or By-Laws of this Association.

ARTICLE IV. Each local branch having twenty-five active or voting members shall be entitled to elect one member every three years, who shall become and continue a member of the Council of this Association for that time.

ARTICLE XIII.

Miscellaneous.

ARTICLE I. Every proposition to alter or amend these by-laws shall be submitted in writing at a general session, and may be balloted for at any subsequent general session, when, upon receiving the votes of three-fourths of the members present, it shall become a part of the by-laws.

BY-LAWS OF THE COUNCIL

(Revised to September 1, 1917, inclusive.)

CHAPTER I.

Of the Election of Officers.

ARTICLE I. The officers of the Council shall consist of a Chairman, a Vice-Chairman and a Secretary, who shall be elected by ballot by the Council, to serve one year.

ARTICLE II. They shall be elected and shall assume the duties of their respective offices after the election of new members of the Council by the Association.

CHAPTER II.

Of the Chairman and Vice-Chairman.

ARTICLE I. The Chairman shall preside at all meetings of the Council; in his absence or on account of inability from any cause, the Vice-Chairman, or, in the absence of both, a Chairman *pro tempore*, shall perform the duties of the Chairman.

ARTICLE II. The Chairman of the Council shall confer with the Chairman of the various special and standing committees of the Association, during its sessions, in order to arrange and expedite the business of the Association.

CHAPTER III.

Of the Secretary.

Article I. The Secretary shall keep fair and correct minutes of the proceedings of the meetings and carefully preserve all reports and papers of every description received by the Council. He shall receive an annual salary not to exceed $300, and the amount of his expenses incident to the meeting, in addition to his salary.

Article II. He shall read all the papers handed him by the Chairman for that purpose; shall call and record the ayes and nays whenever they are required to be called; he shall notify the Chairman of every special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act, and shall notify every member of the time and place of each meeting of the Council.

CHAPTER IV.

Of Committee on Publication.

Article I. The Committee on Publication shall consist of five members, to be elected by ballot by the Council, together with the Editor-in-chief of the Journal, the General Secretary, the Reporter on the Progress of Pharmacy and the Treasurer as *ex-officio* members. The Council shall elect the Chairman.

Article II. The Committee on Publication shall have charge of the editing, publication and distribution of the Report on the Progress of Pharmacy and the Journal of the Association, and such other publications as may be issued, under rules and regulations to be approved by the Council.

Article III. The Editor-in-chief of the Journal shall be elected annually, and shall receive from the Treasurer for his services such compensation as the Council may direct.

Article IV. The Editor-in-chief of the Journal shall have charge of the editing, publication and distribution of the Journal subject to the rules and regulations of the Committee on Publication.

Article V. In case of illness or other inability of the Editor-in-chief to carry on the work of the Journal, the Committee on Publication shall be authorized to make the best arrangements possible to continue the work.

CHAPTER V.

Of Committee on Finance.

Article I. The Finance Committee shall consist of three members and shall each year, previous to January 1, present to the Council for its consideration a list of appropriations to cover the various expenditures of the ensuing fiscal year. No payment shall be made in excess of any of the said appropriations, except by a special vote of the Council. Provided, however, that the Treasurer is authorized to transfer from one appropriation account to another such amount as may

be needed at any time, the amount of any such transfer not to exceed the sum of fifty ($50.00) dollars.

All motions and resolutions involving the expenditure of any sum in excess of $25.00 shall have the approval of the Finance Committee before being acted upon by the Council.

All appropriations made for any fiscal year shall lapse at the end of the said fiscal year. Provided, however, that accounts properly chargeable against any of said appropriations prior to their expiration, but not received by the General Secretary until after the end of the fiscal year, may be paid from such appropriation, in case the warrant for such payment be drawn not later than twenty days after the expiration of said fiscal year.

CHAPTER VI.

Of Committee on Centennial Fund.

ARTICLE I. A Committee on the Centennial Fund shall be formed, consisting of the President or one of the Vice-Presidents of the Association, of the Chairman of the Committee on Finance, and the General Secretary. It shall receive applications in writing from members for grants from the interest derived from the Centennial Fund, the applications to be accompanied by a statement of the investigation to be made, and of the amount and cost of material required—it being understood that the results of the investigation, together with a full report thereon, be laid before the annual meeting of the Association.

ARTICLE II. The Committee shall consider these applications, and at as early a date as possible shall report to the Council an outline of the proposed investigations, together with such recommendations of grants from the available funds as it may deem proper.

ARTICLE III. The Council shall decide upon these recommendations, and in case the grants be approved, the Chairman of the Council shall direct orders to be drawn upon the Treasurer in favor of those members to whom grants have been made.

CHAPTER VII.

Of Sessions.

ARTICLE I. The Council shall meet previous to the assembling of the Association, and at such other times as it may determine, or at the call of the Chairman.

ARTICLE II. On the written application of three members to the Chairman of the Council, a special session shall be called.

ARTICLE III. Nine members of the Council shall constitute a quorum.

ARTICLE IV. The order of business at the first session of the Council shall be as follows:

1. Organization by the election of the Chairman, Vice-Chairman and the Secretary.

2. Election of the Standing Committees of Council, as follows:

a. Committee on Finance, three members.

b. Committee on Publication, five members.

c. Committee on Centennial Fund, three members.

3. Unfinished and deferred business from the last Council, or such business as is especially referred to the Council from the Association.

4. Reading the names of candidates for membership.

5. Reading of reports and appointment of committees.

6. New business.

7. Adjournment—and before the final adjournment, the minutes of the last session of the Council shall be read and approved.

CHAPTER VIII.

Miscellaneous.

Article I. Three members of any of the Standing Committees shall constitute a quorum for the transaction of business.

Article II. In all questions arising before the Council or its Committees, and which can be disposed of by a positive or negative vote, the Chairman of the Council or the Chairman of the Committee may take the vote of their respective bodies in writing, and the same shall have the same force and effect as if members had been personally present, a majority of the votes cast being considered sufficient to decide a question. The ayes and nays of such votes taken by the Council shall be entered upon the minutes.

Article III. Every proposition to alter or amend these By-Laws shall be submitted in writing, and may be balloted for at the next session of the Council, when, upon receiving the vote of three-fourths of the members present, it shall become a part of these By-Laws.

BY-LAWS OF THE SCIENTIFIC SECTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to September 1, 1917, inclusive.)

SECTION I.

NAME.

Article I. This organization shall be known as the Scientific Section of the American Pharmaceutical Association.

SECTION II.

MEMBERSHIP.

Article I. All members of the American Pharmaceutical Association in good standing, who express a desire to do so, by registering their names with the Secretary of the Section, shall become members of the Section.

SECTION III.

OFFICERS.

ARTICLE I. The officers of the Section shall be a Chairman, a First Vice-Chairman, a Second Vice-Chairman and a Secretary, selected from members of the Section.

SECTION IV.

ELECTION OF OFFICERS.

ARTICLE I. The Chairman of the Section shall at the first session appoint a committee of three, who shall report to the Section at the same session two names for each office. At the last session of the Section these names shall be balloted upon, and the one receiving a majority for that particular office shall be declared elected. These shall then be installed and shall hold office for one year or until their successors are duly elected.

ARTICLE II. Officers may be re-elected, but with the exception of the Secretary shall not hold the same office for more than two consecutive years.

ARTICLE III. The Council of the Association shall fill any vacancies that may occur among the officers.

SECTION V.

DUTIES OF OFFICERS.

Chairman and Vice-Chairman.

ARTICLE I. It shall be the duty of the Chairman to represent the Section in the Council of the Association, to preside at the annual meetings of the Section, appoint all committees of the Section and fill any vacancies when occurring in these committees. He may present an annual address on any subject of interest to the Section that he may deem of sufficient importance.

ARTICLE II. In the absence of the Chairman, the First Vice-Chairman shall preside and exercise all the functions of the Chairman.

ARTICLE III. In the absence of the Chairman and the First Vice-Chairman the Second Vice-Chairman shall preside and exercise all the functions of the Chairman.

ARTICLE IV. In the absence of all three of these officers the Section shall elect a temporary Chairman.

Secretary.

ARTICLE V. The Secretary shall keep a record of the proceedings of the Section, shall send to the members such notice as the business of the Section may require, shall transmit to the General Secretary the names of the officers and committees elected or appointed, and notify the General Secretary of any changes in the personnel of the officers or committees of the Section, and shall furnish the General Secretary a report of the sessions held at the annual meeting. The Secretary, at least two months in advance, shall write to each member of this

Section, giving notice of the latest date upon which papers can be accepted for the program.

Article VI. The Secretary shall be custodian of the records and documents of the Section, as well as of all funds, and shall make all disbursements subject to the approval of the Chairman.

Article VII. The Secretary shall arrange the program for the annual meeting, and furnish the editor of the Journal of the Association the program for inclusion in the number just preceding the annual meeting.

Article VIII. The Secretary shall at each annual meeting present a brief report to the Association of the condition within the Section.

Article IX. In case the Secretary is unable to attend the annual meeting, he shall notify the Council to that effect and the Council shall then appoint a temporary Secretary.

SECTION VI.

MEETINGS.

Article I. At least three sessions of the Section shall be held at each annual meeting of the Association. Additional sessions may be held at any time during the meeting when the officers of the Section may see fit, and by consent of the Council; provided, however, that these sessions be so arranged that they conflict as little as possible with sessions of other Sections, and that no session be held simultaneously with the final session of the Association.

SECTION VII.

ORDER OF BUSINESS.

Article I. The order of business at the first session shall be as follows: (1) Chairman's Address; (2) Secretary's Report; (3) Report of Standing Committees and Committees of the Association which report to this Section; (4) Nomination of Officers; (5) Miscellaneous Business; (6) Reading of Papers.

Article II. The time of the other sessions shall be taken up with the reading of papers, excepting as provided for in Section IV (Election of Officers), and Section X (Amendments), or to hear the reports of special committees.

Article III. Provided, however, that discussion of papers may be interrupted at any time to consider matters referred to the Section by the Association in general session or by the Council.

Article IV. This regular order of business may be suspended at any time during a session, for that particular session, by a three-fourth vote of those present.

SECTION VIII.

EXPENSES.

Article I. The expense of printing, postage and stationery shall be paid from the Association treasury, but in no case to exceed $25.00 for one year.

ARTICLE II. Appropriations for expenses other than those named here must be procured by authority of Council through the Chairman of the Section.

SECTION IX.

PAPERS.

ARTICLE I. Original papers on any subject of scientific interest may be accepted at the discretion of the officers of the Section.

ARTICLE II. The complete title and a brief extract of all papers, not to exceed 250 words, must be in the hands of the Secretary in time for inclusion in the program which is published, as provided in Section V, Article 7.

ARTICLE III. Fifteen minutes shall be allowed for the reading of a paper. If the paper is too lengthy to be read in detail within this space of time, it shall be presented in abstract.

ARTICLE IV. Each speaker in the discussion of a paper shall be allowed five minutes, but all such discussion shall be confined to the paper or subject under consideration at that time.

ARTICLE V. The time allowed for presenting a paper or discussion may be extended by unanimous consent of those present.

ARTICLE VI. All papers and reports presented to the Section become the property of the Association and shall be forwarded to the Editor of the JOURNAL immediately following the annual meeting by the Secretary of the Section.

SECTION X.

AMENDMENTS.

ARTICLE I. These by-laws may be amended at the final session of any annual meeting by a two-third vote of those present, provided notice of such amendment is given together with the text thereof at any previous session held at that meeting. Amendments must finally be accepted by the Council as not in conflict with the Constitution and By-Laws of the Association.

SECTION XI.

MISCELLANEOUS.

ARTICLE I. Questions not specifically covered by these by-laws shall always be decided in accord with the Constitution and By-Laws of the Association.

BY-LAWS OF THE HOUSE OF DELEGATES OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to September 1, 1917, inclusive.)

CHAPTER I.

ARTICLE I. Functions. The House of Delegates shall have and exercise the following functions:

A. To receive and consider the reports of delegates from the bodies which they represent in the House of Delegates and to receive the greetings of fraternal delegates to the Association from other organizations or from departments of the United States Government.

B. Consider and report upon such resolutions and upon such other subjects as may be referred to the House of Delegates by the Council or by the Association in general session, or by the various Sections.

C. Make a final report of the business transacted by the House of Delegates to the Association not later than the last general session at each annual meeting.

D. It shall have the authority to adopt all rules and regulations necessary for the proper conduct of its business and not inconsistent with the Constitution and By-Laws of the Association and the Council.

CHAPTER II.

Article I. Representation. The membership of the House of Delegates shall consist of three regularly appointed delegates from each state pharmaceutical association, from the District of Columbia Association, and from similar associations in Porto Rico, the Philippines and any other foreign American state.

Delegates from all other bodies or organizations shall have the privilege of the floor but shall not have the right to vote.

Article II. Term of Service. The elected or appointed delegates shall hold office for one year, or until the credentials of their successors shall have been approved by the Council.

CHAPTER III.

Article I. Organization. The first session of the House of Delegates at each annual meeting shall be called to order by the Chairman, or one of the Vice-Chairmen, or the Recording Secretary of the preceding House; or, in the absence of all of these, by the General Secretary of the Association.

Article II. Voting. Each delegate shall be entitled to one vote. No delegate shall act as proxy of another delegate who has not been seated, nor as delegate for more than one association, organization, or institution.

Article III. Privileges. Any member of the American Pharmaceutical Association may attend any session of the House of Delegates and shall have the privilege of the floor.

CHAPTER IV.

Article I. Officers. The officers of the House of Delegates shall consist of a Chairman, two Vice-Chairmen and a Recording Secretary, who shall be elected annually by ballot by the House of Delegates.

Article II. Duties of Chairman and Vice-Chairmen. The Chairman shall preside at all meetings of the House of Delegates; in his absence, or on account of inability from any cause, the First Vice-Chairman; or, in his absence, the Second Vice-Chairman; or in the absence of the three, a Chairman *pro tempore* shall perform the duties of the Chairman.

ARTICLE III. Duties of the Recording Secretary. The Recording Secretary shall keep fair and correct minutes of the proceedings of the meetings and carefully preserve all reports and papers of every description received by the House of Delegates, and deliver the same to the General Secretary of the Association at the annual meeting. The Recording Secretary shall read all papers received for the purpose; shall call and record the ayes and nays whenever they are required to be called; shall notify the Chairman of every special committee of his appointment, giving a list of his colleagues, and stating the business on which the committee is to act, and shall give notice of the time and place of each meeting of the House of Delegates.

ARTICLE IV. The General Secretary of the Association shall, in January of each year, send appropriate blank credentials for delegates to the various bodies entitled to representation in the House of Delegates, notify the said associations of the time when the credentials, properly filled out, shall be returned, and on or preceding the first day of the annual convention shall deliver such credentials to the Recording Secretary. All credentials received after the opening of the convention shall be handed directly to the Recording Secretary.

The General Secretary shall cause all of the proceedings of the House of Delegates annually to be printed in the JOURNAL of the Association, and shall procure a sufficient number of reprints of the same for distribution among the members of the House of Delegates and the officers of the Association. Said reprints shall also contain the by-laws and a list of the members, officers and committees of the House of Delegates.

CHAPTER V.

ARTICLE I. Sessions. The House of Delegates shall hold at least one session during the annual meeting of the Association at an hour previously determined by the Executive Committee and such additional sessions as may be necessary for the transaction of its business.

CHAPTER VI.

ARTICLE I. The Committee on Resolutions. The Chairman shall appoint a Committee on Resolutions consisting of five members, to which shall be referred all resolutions, and which shall report to the House the results of its deliberation not later than the last session of the House.

ARTICLE II. The Chairman, Vice-Chairmen and Recording Secretary shall constitute an Executive Committee to pass upon the credentials of representatives to the House of Delegates, to arrange the program for the annual meeting, and to perform such other duties as are commonly discharged by executive committees, or which may be referred to them by the Association or by the House of Delegates.

ARTICLE III. Special Committees. The Chairman shall appoint such special committees as may be directed by the House.

CHAPTER VII.

ARTICLE I. Resolutions. All resolutions shall receive a majority of affirmative votes of those present for adoption.

Article II. Amendments. Every proposition to amend these by-laws shall be submitted in writing at one session of the House and may be balloted upon at the next session, when upon receiving the affirmative vote of three-fourths of the members present it shall become a part of the by-laws.

CHAPTER VIII.

ORDER OF BUSINESS.

The following shall be the Order of Business:

1. Calling Roll of Delegates whose credentials have been approved by the Executive Committee.
2. Appointment of Committee on Resolutions.
3. Reading of communications from the Association, Sections and Council.
4. Calling Roll of Delegations for reports, resolutions and communications, all of which shall be in writing.
5. Miscellaneous business.
6. Election and Installation of Officers.
7. Adjournment to a certain time.

GENERAL RULES OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to September 1, 1917, inclusive.)

Rule 1. Advertisements for Publications: At the forty-seventh annual meeting (1889), the Council resolved that no advertisements be solicited or accepted for any of the publications or programs issued by or in the name of the Association, and the General Secretary was instructed to inform annually the Local Secretary and pharmaceutical press of the resolution.

Rule 2. Term of Council Members from Local Branches: At the 55th annual meeting (1907), it was ordered that the three-year term of members of the Council elected by Local Branches of the A. Ph. A. shall date from the last annual meeting of the Association held previous to the date of election of the new Council members by a Local Branch.

Rule 3. Proceedings of National Association of Boards of Pharmacy and American Conference of Pharmaceutical Faculties in A. Ph. A. Journal: That space be annually set aside in the Journal of the American Pharmaceutical Association for abstracts of the Proceedings of the meetings of the National Association of Boards of Pharmacy and the American Conference of Pharmaceutical Faculties.

Rule 4. Salary Year of Officers: At the fifty-seventh annual meeting (1909), it was ordered that the salary year of the officers of the American Pharmaceutical Association be changed so as to run from July of one year to July of the next year, instead of, as heretofore, from September to September.

Rule 5. Names of Life Members: At the fifty-seventh annual meeting (1909), it was ordered that the names of life members, new style, be designated in the published Roll and List of Members by means of heavy-faced or black-faced type.

Rule 6. Approval of Application for Membership: At the fifty-eighth annual meeting (1910), it was ordered that the Committee on Membership submit all names of applicants for membership to the respective State representative on the committee for approval before sending the application to the Secretary of the Committee on Membership for submission to the vote of the Council, or if they be sent direct to the Secretary of the Committee on Membership, they shall be sent by him first to the State representative for approval. The Secretary of the Committee on Membership shall have discretionary power in the application of this rule.

Rule 7. Resignation of Members: At the fifty-eighth annual meeting (1910), it was ordered that the resignation of a member may be accepted during the first six months of the fiscal year for which his annual dues are payable.

Rule 8. Address of Welcome at Opening General Session: Address of welcome and responses thereto at the opening general session shall be omitted.

Rule 9. Meetings of Council: The meetings of the Council shall be held in the evenings with the exception of the first and the last sessions.

Rule 10. Time of Section Meetings: The work of the various Sections shall start promptly in the morning at 9.30 o'clock, lasting until 12 o'clock, and in the afternoon at 2 o'clock, lasting until 5 or 6 o'clock.

Rule 11. Section and Association Meetings: The Section and Association meetings shall be confined to mornings and afternoons.

Rule 12. Concurrent Meetings of Sections: The principle of concurrent meetings of the Section shall be established. There shall be used a series of bulletins in the section rooms notifying members what papers are being read and discussed in the different several Sections.

Rule 13. Manuscripts for Section Meetings: The chairmen of the Sections shall use every endeavor to secure all manuscripts within four weeks of the annual meeting, and shall immediately send them to the General Secretary.

Rule 14. Printing of Accepted Manuscripts: The General Secretary shall have accepted manuscripts printed in advance of the annual meeting, whenever in the judgment of the Chairman of the Section and the General Secretary it is desirable.

Rule 15. Collective Program of Sections: With all manuscripts in hand three or four weeks before the annual meeting, the General Secretary shall prepare a collective program containing the detailed programs of the different Sections and indicating at what particular session any given paper shall come up for reading and discussion.

Rule 16. Editor as Historian: The Editor-in-chief of the JOURNAL shall be *ex-officio* Historian of the Association.

GENERAL RULES OF FINANCE OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to September 1, 1917, inclusive.)

Rule 1. Deposits of Moneys of Funds: The Treasurer shall deposit all moneys received by him, except those belonging to the various "Funds," with some reli-

able banking company, where said money may be drawing interest for the benefit of the Association, said banking company to be designated by the Finance Committee and approval by the Council.

Rule 2. Payments of Moneys of Funds: Said moneys shall be deposited in the name of the American Pharmaceutical Association, and shall be paid out by numbered checks drawn by the Treasurer, on written warrant signed by the General Secretary.

Rule 3. Payment of Bills: The correctness of every bill shall be certified to by the person contracting the same and the General Secretary, and the latter shall note on the bill the appropriation against which the same is to be charged. The bill shall then be submitted to the Chairman of the Committee on Finance for approval, before payment is made. A warrant shall then be drawn and signed by the General Secretary, upon receipt of which, together with the original bill and voucher, the Treasurer shall draw a check for the amount.

Rule 4. Deposits in Banks: The Treasurer shall make a daily deposit in bank whenever his receipts amount to $100 or more.

Rule 5. Custodian of Funds: The Treasurer shall be the custodian of the bonds and saving-bank books, representing the several Funds belonging to the Association; and bonds and bank-books shall be in the name of the Treasurer, and the accounts of the same shall be kept by him.

Rule 6. Appointment of Auditing Committee: There shall be annually appointed by the Council an Auditing Committee, this Committee to consist of three members residing in or near the same city or town as that in which the Treasurer resides, the Chairman to be named by the Chairman of the Council.

Rule 7. Annual Report of Treasurer, General Secretary and Editor: The Treasurer, General Secretary and Editor shall balance their books on January 1st of each year and shall make out previous to the fifteenth day of February following, their annual reports for the financial year just closed.

Rule 8. Auditing of Accounts of Treasurer, General Secretary and Editor: The Treasurer, General Secretary and Editor having thus balanced their books and made out their reports, shall place all such books, accounts, vouchers, etc., with the reports, at the disposal of the Chairman of the Auditing Committee at such time and place in February of each year as the said Chairman may direct.

Rule 9. Return of Books to Treasurer, General Secretary and Editor: Said books, accounts, vouchers, saving-bank books and accounts of the same shall be returned to the Treasurer, General Secretary and Editor, respectively, within two weeks of the date of their reception by the Chairman of the Auditing Committee.

Rule 10. Meeting of Auditing Committee: There shall be a meeting of the Auditing Committee in February of each year, and it shall be the duty of said Committee, at such meeting, to carefully examine all the books, accounts, vouchers, funds, etc., received by them; and previous to the first day of March following, to make a report thereon, in writing, to the Chairman of the Council.

Rule 11. Expense of Bonds of Treasurer and General Secretary: The expense of the bonds of the Treasurer and General Secretary given by a Trust Company, shall be paid for from the Treasury.

Rule 12. Merging of Balances: All balances remaining from appropriations at the close of each fiscal year shall be turned back into the treasury, unless otherwise ordered by the Council.

Rule 13. Committee on Invested Savings and Trust Funds: The Chairman of the Council is instructed to appoint three members of the Association who, together with the Treasurer, shall be known as the Committee on Invested, Savings and Trust Funds.

Of the three members first appointed, one shall be appointed for one year, one for two years and one for three years. Each year thereafter, one member shall be appointed for three years. Members of the committee need not be members of the Council.

It shall be the duty of said committee to carefully consider the nature and status of all invested, savings and trust funds of the Association, and to make an annual written report upon the same to the Council, which report shall be read (in full) at one of the general sessions of the annual convention of the Association, and published (in full) in the annual volume of Proceedings thereof.

The present custody of the funds shall not be affected by the adoption of these resolutions, neither shall the committee have the power to invest or reinvest any of such funds, except as instructed by the Council or Association.

Rule 14. Disposal of Receipts from the National Formulary: The Treasurer shall keep a separate and accurate account of all receipts of and disbursements for the National Formulary. Any balance of receipts in excess of disbursements, remaining at the end of any fiscal year, after making due allowance for any outstanding indebtedness on behalf of the National Formulary, shall be credited as follows: Fifty per cent. to the general funds of the Association as partial repayment for that portion of the overhead charges of the Association incurred on behalf of the National Formulary; and the remaining fifty per cent. to the credit of the American Pharmaceutical Association Research Fund. This fund is to be held as a permanent fund by the American Pharmaceutical Association through its Council or controlling body.

Until such time as the American Pharmaceutical Association Research Fund has accumulated from this source or from bequests, contributions, etc., a fund of not less than one hundred thousand ($100,000.00) dollars, the Council may expend not more than fifty per cent. of the net income of said Fund. When this Research Fund shall exceed one hundred thousand ($100,000.00) dollars, then the Council may expend annually a sum not exceeding the income derived from the investments held by the said Research Fund.

From the funds thus available, the Council may grant such honorariums or awards to encourage investigation and research upon any subject relating in any way to pharmacy or to the collateral sciences as may in their judgment be deemed proper. In the granting of such honorariums or awards, preference shall be given to such applications or subjects as are recommended by the committees of Revision of the United States Pharmacopœia or the National Formulary.

Rule 15. Depository of the American Pharmaceutical Association Research Fund: That the selection of the depository and all investments of the funds of the American Pharmaceutical Association Research Fund shall be made by the Treasurer and the Committee on Finance.

Rule 16. Designation of Safe Deposit Vaults for Funds and Securities: That the Committee on Invested and Trust Funds shall annually recommend to the Council the banks and safe deposit vaults in which the funds and securities, respectively, of the Association shall be kept for the ensuing year.

GENERAL RULES OF PUBLICATION

(Revised to September 1, 1917, inclusive.)

1. Approval and Payment of Bills of JOURNAL: All bills on account of the JOURNAL shall be certified to by the Editor and sent as soon as possible to the Chairman of the Committee on Publication for approval and then sent by the latter to the General Secretary for payment in accordance with Article II, Chapter V, of the by-laws and Rule 3, of the General Rules of Finance except bills for postage, stationery, drayage, freight, expressage, miscellaneous and clerical expenses of the office of the JOURNAL (Petty and Clerical Expenses, JOURNAL Office), which shall be paid as provided for in Rule 2 of these rules.

2. Bills for Petty and Clerical Expenses, JOURNAL Office: Bills for postage, stationery, drayage, freight, expressage, miscellaneous and clerical expenses of the Office of the JOURNAL (Petty and Clerical Expenses, JOURNAL Office) shall be paid by check by the Editor of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION out of a deposit of $300 to be made to the credit of the Editor of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION in a bank to be approved by the Committee on Publication. The Editor shall be bonded for $500 at the expense of the Association.

The procedure for the payment of such bills shall be as follows: (1) at the end of each month, the Editor shall send all paid-and-receipted bills and cancelled checks, with an itemized bill or statement, to the Chairman of the Committee on Publication for approval; (2) after approval, the Chairman of the Committee on Publication shall send the bills and checks to the General Secretary for payment in accordance with Article II, Chapter V, of the by-laws and Rule 3 of the General Rules of Finance; and (3) the Treasurer shall send the Editor a check to cover the amount of the bills and thus increase the bank balance.

3. Bills for Year Book, National Formulary and Publications: All bills on account of the Year Book, National Formulary and other publications of the Association shall be certified to by the person contracting the same and approved by the Chairman of the Committee on Publication and sent by the latter to the General Secretary before payment in accordance with Article II, Chapter V, of the by-laws, and Rule 3 of the General Rules of Finance.

THE FUNDS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to January 1, 1918.)

At the San Francisco meeting in 1889, the Permanent Secretary was directed to publish annually, in the Proceedings, a brief history of the origin, money value, and use to which each Fund may be applied.

There are six Permanent Funds, a General Fund, and three Trust Funds at the present time.

The Permanent Funds are (1) Life Membership; (2) Ebert Prize; (3) Centennial; (4) Endowment; (5) Ebert Legacy; (6) American Pharmaceutical Association Research Fund.

THE A. PH. A. LIFE MEMBERSHIP FUND.

The Constitution, as originally adopted in 1852, and up to the year 1856, contained no provision for life membership or for the creation of a permanent fund. In the year named a revised Constitution was reported by a committee, and after consideration, adopted (see Proceedings, 1856, pp. 12, 14, 27 and 79), Article II, Section 7 (afterwards Section 8), containing the following provision:

"Members who have paid their annual contribution for ten successive years shall be considered life members and exempt from their yearly payments, and entitled to a certificate to that effect."

Owing to increased expenditures for the publication of the Proceedings, etc., the Association found it necessary in 1867 (Proceedings, p. 75) to increase its revenue, one of the measures being the erasing of Section 8, and the total abandonment of life membership in the future.

In 1870 a revised Constitution was adopted (see Proceedings, 1870, pp. 87–96) and this, with a few slight amendments adopted in 1896 and 1900, read as follows:

"Article IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, the interest of which for any current year only may be used by the Association for its expenses."

In 1913 this article was amended to read as follows and is now in force:

"Article IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, may be invested by the Treasurer in United States Government, State, Municipal, County or other securities acceptable as security for postal savings deposits, the interest of which for any current year only may be used by the Association for its expenses."

Chapter VI, Article 5, of the By-Laws adopted the same year, reads as follows: "Any member who shall pay to the Treasurer the sum of *seventy-five dollars at a time* shall become a life member, and shall be exempt from all future annual contributions."

This article was amended in 1888 and 1896 and again in 1906 and changed to Article IV, Chapter VIII. As now in force, it reads as follows:

"Any member of the Association who shall pay to the Treasurer the sum of $100.00 during the first year of his connection therewith, and also any member not in arrears, who after ten years shall pay the sum of $75.00, or after fifteen years the sum of $50.00, or after twenty years the sum of $40.00, or after twenty-five years the sum of $25.00, and any member who may have paid annual dues for thirty-seven consecutive years, shall become a life member, and shall be exempt from all future annual contributions."

In the roll of members for the year 1872 (p. 338) the name of the late Charles W. Badger, of Newark, N. J., appears for the first time as a life member, and the

only one (until the time of his death in 1877) under this provision, which was subsequently modified (Proceedings, 1879, p. 799) so as to reduce the sum to be paid into the treasury by those who had been members for from five to twenty years. In the same year the published roll contained the names of two new life members. The article on life membership was further modified in 1888 (Proceedings, p. 52), again in 1896 (Proceedings, p. 17), and again in 1906 (Proceedings, p. 100), so as to apply to those who have been members for over twenty years (see Chapter VIII, Article IV, of the By-Laws). Under this clause the life membership (new style) of the present roll is one hundred and seventeen.

The Treasurer's report for 1880 (p. 524) states the life membership fund to be $75, for 1881 (p. 513) $613, for 1882 (p. 608) $685, for 1883 (p. 436) $904.38, and for 1884 (p. 524) $944.14. At the Milwaukee meeting, held in the same year, the Association directed (Proceedings, p. 525) that $316, which amount had been in past years donated to the funds of the Association by various members, be withdrawn from the general fund to be added to the Life Membership Fund. At the Providence meeting in 1886 (Proceedings, p. 147) it was recommended by the Finance Committee, and approved by the Council and by the Association, that the sum of $3,000 be transferred from the general fund to the Life Membership Fund. At the Cincinnati meeting in 1887 (Proceedings, p. 471) the Association ordered again a transfer to the same fund of $4,000.

From 1887 to 1909 the annual reports of the Chairman of the Council give the number of each bond of the registered securities in which the Life Membership Fund is invested. Since 1910 the Treasurer has made this report. By vote of the Association, the name of this fund was changed to the William Procter, Jr., Fund on September 15, 1902 (see Proceedings, 1902, p. 214), but was changed back to its original name, Life Membership Fund, on September 5, 1906 (see Proceedings, 1906, p. 100). The report of the Treasurer on the special funds of the Association, contained in the addendum to his annual report, shows that on January 1, 1918, the value of the Life Membership Fund was $22,644.60 (face values of securities only given), of which sum the interest for any current year only may be used by the Association for its expenses.

THE EBERT PRIZE FUND.

At the Richmond meeting in 1873 (Proceedings, p. 58), Mr. Albert E. Ebert presented to the Association the sum of five hundred dollars to be used in the following manner:

"The money to be properly invested by order of the Executive Committee, and the annual interest derived therefrom to be appropriated for *conferring a suitable prize* for the best essay or written contribution containing AN ORIGINAL INVESTIGATION OF A MEDICINAL SUBSTANCE, determining new properties, or containing other meritorious contributions to knowledge; or for IMPROVED METHODS of determining merit, for the preparation of chemical or pharmacal products; the prize to be awarded by a suitable committee within six months after the annual meeting at which the essays are presented for competition; provided, that in case no one of the essays offered is of sufficient merit to justify the award, in the judgment of the Committee on Prize Essays, all may be rejected, and the sum added to that of the Fund."

The offer was accepted by the Association, and by a special vote (*Ibid.*, p. 70) the fund was ordered to be called the *Ebert Fund*, and the prize awarded from the proceeds to be known as the *Ebert Prize*.

The Ebert Prize was awarded for the year 1874 to Charles L. Mitchell; for 1877, to Fred B. Power; for 1882, to John U. Lloyd; for 1886, to Emlen Painter; for 1887, to Edward Kremers; for 1888, to Jos. F. Geisler; for 1890, to Wm. T. Wenzell; for 1891, to John U. Lloyd; for 1897, to Albert B. Prescott and Jas. W. T. Knox; for 1898, to Virgil Coblentz; for 1899, to Henry Kraemer; for 1900, to Edward Kremers and Oswald Schreiner; for 1902, to J. O. Schlotterbeck and H. C. Watkins; for 1903, to Fred B. Power; for 1905, to Dr. Ernest Schmidt, of Germany; for 1906, to J. O. Schlotterbeck and H. C. Watkins; for 1907, to Fred B. Power and Frank Tutin; for 1908, to A. B. Stevens and L. E. Warren; for 1909, to Henry Kraemer; for 1910, to Harry M. Gordin; for 1911, to W. A. Puckner and L. E. Warren; for 1915, to E. N. Gathercoal; for 1916, to John Uri Lloyd.

The Ebert Fund amounted in 1883 (Proceedings, p. 436) to $683.43. From 1887 to 1909 the reports of the Chairman of the Council specify the securities in which this fund is invested. Since 1910 the report has been made by the Treasurer. On January 1, 1918, its reported value was $1133.27 (face value of securities only given). The annual interest must be applied to a prize for an original investigation meeting the requirements stated above.

In accordance with the recommendation of the committee on invested savings and trust funds, submitted and adopted at the fifty-eighth annual meeting (see Proceedings, 1910, p. 454) the name of the Ebert Fund was changed to Ebert Prize Fund, and the amount of the prize limited to $25.00 until the excess of interest above the sum annually awarded and added to the principal shall amount to $1,000.00, after which the entire annual interest upon the same shall constitute the Ebert Prize.

THE A. PH. A. CENTENNIAL FUND.

After the meeting held in Philadelphia in 1876, the local committees, on settling all accounts for the entertainment of the Association, had an unexpended balance left which by subsequent collections made in Philadelphia was increased to $525. At the Toronto meeting in 1877 (Proceedings, p. 481), Dr. A. W. Miller, local secretary for 1876, presented this sum in the name of the local committees to the Association, with this condition, "that a like amount be subscribed by the members within one year," with a view of establishing a fund to *aid in the prosecution of original investigations*, the interest accruing from the investment of the fund to be devoted to the defraying of expenses actually incurred by members in conducting investigations in some branch of science connected with pharmacy. The Association accepted the conditions (*Ibid.*, pp. 526–528), and adopted the name *Centennial Fund*.

The collection of a like amount by the Association was completed at the Saratoga meeting (Proceedings, 1880, p. 553) when $582.81 had thus been received. In the following year a committee of the Centennial Fund was provided for in the By-Laws of the Council, Chapter VII (Proceedings, 1881, pp. 190, 549). Members have not availed themselves of this fund to the extent contemplated at its foundation; for the amounts paid out have been only $7.50 to Robt. B.

Warder for material used for investigations reported in 1885; $96.80 used by the Committee on National Formulary during the years 1886 and 1887 (Proceedings, 1889, p. 16); and $32 to Edward Kremers for material necessary for the prosecution of scientific research on the menthol group, reported in the Proceedings for 1892; $50 to the same investigator in 1893, and $50 again to the same investigator in 1894. In 1896 the sum of $22.33 was paid to the Committee on Indicators for material used in their investigations. In 1915 the sum of $100 was paid Edward Kremers for research work on cultivation of medicinal plants.

The original sum of $1107.81 ($525 + $582.81) had increased in 1883 to $1232.76. From 1887 to 1909 the securities in which the fund is invested are specified in the reports of the Chairman of the Council. Since 1910 the reports have been made by the Treasurer. The value was $3057.68 (face value of securities only given) on January 1, 1918. The interest accruing from this Fund is to be used for defraying the expenses incurred in conducting original investigations in pharmacy or an allied science.

THE A. PH. A. ENDOWMENT FUND.

At the fifty-fourth annual meeting, held at Indianapolis, Ind., September, 1906, Messrs. Samuel A. D. Sheppard and James H. Beal proposed the establishment of a permanent fund to be known as the "Endowment Fund" (see Proceedings, 1906, p. 99) under the following conditions:

"That the said S. A. D. Sheppard and J. H. Beal jointly agree to pay into said fund one dollar for each twenty dollars contributed and paid into said fund by all other members of this Association up to and until such Endowment Fund shall, with its accumulations of interest, reach the sum of twenty-five thousand ($25,000) dollars.

"That as money shall be received as additions to said fund the same shall be invested in such securities as the Council may direct until the interest and other accumulations, together with the amount of the principal, shall reach the sum of twenty-five thousand ($25,000) dollars.

"That when the Endowment Fund shall have reached the sum of twenty-five thousand ($25,000) dollars one-half the income derived therefrom may be used for any purpose deemed wise by the Association.

"That when said Endowment Fund, inclusive of donations, interest and other accumulations, shall amount to the sum of fifty thousand ($50,000) dollars, the Association may use ninety per cent. of the income therefrom for any purpose deemed wise by the Association.

"That under no circumstances whatever shall all the income from said fund be used, but at least ten per cent. thereof shall be annually added to the principal of the Endowment Fund.

"That under no circumstances whatever shall the principal or any part thereof be used for any purpose except investment for income, nor pledged for any debt or obligation of the Association, or any person, nor used for any other purpose or in any other manner than as specified."

Contributions to the Endowment Fund have been made at different times, and the names of the contributors published in the annual volume of Proceedings (see Proc., 1907, pp. 47 and 48; Proc., 1908, pp. 476 and 477; Proc., 1909, p. 464; Proc., 1910, p. 478). According to the Treasurer's report, the total amount contributed and interest accumulations up to January 1, 1918, was $6864.30.

THE EBERT LEGACY FUND.

The late Albert E. Ebert having by his will designated the A. Ph. A. as residuary legatee of his estate, it was ordered at the fifty-eighth annual meeting, on recommendation of the Committee on Invested Savings and Trust Funds, that the money received from the estate be converted into a fund to be known as the Ebert Legacy Fund, and that this fund be invested in municipal or other public bonds approved by the Committee on Invested Savings and Trust Funds and the Finance Committee, and that this fund be kept intact and the income added thereto until the fund and its accumulations shall together amount to a total of $10,000.00.

When this sum has been reached, the income derived from the fund shall be devoted to such purposes as will in the opinion of the Council best commemorate the founder of the fund and his services to pharmacy.

The reason for the suggestion that the Ebert Fund and the Ebert Legacy Fund be kept separate was, that the first was given by Mr. Ebert for a specific purpose, while the latter was given to the Association practically without restriction and with the evident intention that the Association should use it in the manner which it deemed best.

On December 14, 1909, the executors of the Ebert estate paid over to the Treasurer of the A. Ph. A. the sum of $2,800.00, which has been deposited in the International Bank of St. Louis at interest. The Treasurer's report states that January 1, 1918, this fund amounted to $4324.47.

AMERICAN PHARMACEUTICAL ASSOCIATION RESEARCH FUND.

The Association at the 1915 meeting took the first action resulting in this fund. It was then decided to make the net balance each year in the National Formulary account a part of the Endowment Fund (see JOURNAL A. PH. A., November, 1915, p. 1376). The following rule was adopted:

"Rule 14. Disposition of Receipts from National Formulary: The Treasurer shall keep a separate and accurate account of all receipts and disbursements for the National Formulary. Any balance of receipts in excess of disbursements remaining at the end of any fiscal year shall be credited to the Endowment Fund and become a part thereof."

The Committee on Publication at the 1916 meeting recommended the modification of Rule 14, and the establishment of a National Formulary Revision and Research Fund (see JOURNAL A. PH. A., October, 1916, pp. 1142 and 1144, and November, 1916, p. 1280). This resulted in the appointment of a committee to report at the 1917 meeting. Under these conditions no money was paid into the Endowment Fund under Rule 14.

The net amount to the credit of the National Formulary IV during the year 1916 was $13,903.67 (see JOURNAL A. PH. A., August, 1917, p. 749).

At the 1917 meeting the association changed Rule 14 to read as follows (see JOURNAL A. PH. A., December, 1917, p. 1100):

"Rule 14. Disposal of Receipts from the National Formulary: The Treasurer shall keep a separate and accurate account of all receipts of and disbursements for the National Formulary. Any balance of receipts in excess of disbursements, remaining at the end of any fiscal year, after making due allowance for any out-

standing indebtedness on behalf of the National Formulary, shall be credited as follows: Fifty per cent. of the general funds of the Association as partial repayment for that portion of the overhead charges of the Association incurred on behalf of the National Formulary; and the remaining fifty per cent. to the credit of the American Pharmaceutical Association Research Fund. This fund is to be held as a permanent fund by the American Pharmaceutical Association through its Council or controlling body.

"Until such time as the American Pharmaceutical Association Research Fund has accumulated from this source or from bequests, contributions, etc., a fund of not less than one hundred thousand ($100,000.00) dollars, the Council may expend not more than fifty per cent. of the net income of said Fund, When this Research Fund shall exceed one hundred thousand ($100,000.00) dollars, then the Council may expend annually a sum not exceeding the income derived from the investments held by the said Research Fund.

"From the funds thus available, the Council may grant such honoraria or awards to encourage investigation and research upon any subject relating in any way to pharmacy or to the collateral sciences as may in their judgment be deemed proper. In the granting of such honoraria or awards, preference shall be given to such applications or subjects as are recommended by the committees of Revisions of the United States Pharmacopœia or of the National Formulary."

In accordance with instructions of the association (see JOURNAL A. PH. A., December, 1917, p. 1100) the treasurer transferred 50 per cent. of the National Formulary Research Fund to the American Pharmaceutical Association Research Fund and 50 per cent. to the general funds of the association. This with the interest gave the A. Ph. A. Research Fund $7043.31. To this has been added $4059.24 from the National Formulary IV account for 1917 making a total of $11,102.55 on January 1, 1918.

THE A. PH. A. GENERAL FUND.

On February 26, 1909, the Council directed that $5,000.00 of the current funds of the Association be invested by the Treasurer in some interest-bearing security, to be approved by the Finance Committee and the Chairman of the Council (see Proc., 1909, p. 449). In accordance with this order the Treasurer reported on May 26, 1909, having purchased five $1000.00 St. Louis, Mo., 4 per cent. bonds at $103^5/_8$ and accrued interest. Again, on November 15, 1909, the treasurer, in accordance with an order of the Council (see Motion No. 11, p. 449), invested $5000.00 of the current funds of the Association in St. Louis public buildings and public works 4 per cent. gold bonds. These bonds are registered in the name of the Treasurer of the A. Ph. A., and are kept in the Association's safe-deposit box.

The following funds are held in trust by the A. Ph. A.: (1) Wm. Procter, Jr., Monument; (2) College Prize; (3) Rice Memorial.

THE WM. PROCTER, JR., MONUMENT FUND.

At the fifty-second annual meeting held at Kansas City, Mo., September, 1904, it was resolved to solicit subscriptions for a memorial monument to be erected in the Smithsonian Grounds at Washington, D. C., to the memory of William Proc-

ter, Jr., if possible in 1917, the centennial anniversary of his birth. A committee was appointed to take the matter in charge, which since that time has been active in soliciting subscriptions. The names of contributors have been published from time to time in the annual volume of Proceedings (see Proc., 1906, p. 63; Proc., 1907, p. 98).

In September, 1907, at the annual meeting held in New York City, the Association directed that all moneys collected for the William Procter, Jr., Monument Fund be turned over to the Treasurer of the A. Ph. A. to be deposited on interest for the benefit of said fund (see Proc., 1907, p. 99). The Treasurer of the A. Ph. A., in his annual report for 1908–1909, reports having received on January 27, 1909, the sum of $3,413.33 from the Treasurer of the Committee, Benj. T. Fairchild, which was placed on time deposit in the International Bank of St. Louis, Mo., for a period of twelve months at 4 per cent. per annum (see Proc., 1909, p. 472). This certificate has been renewed annually. The total sum to the credit of this fund, including interest on time deposits, according to the Treasurer's report on January 1, 1918, amounted to $8486.20.

RICE MEMORIAL FUND.

A joint committee was appointed by the Chairman of the Committee of Revision of the U. S. P., on June 26, 1901, to report to the Board of Trustees and Committee of Revision upon a suitable plan for honoring the memory of Dr. Charles Rice.

It was decided, after hearing the report of the Committee, to erect a monument over Dr. Charles Rice's grave and to prepare a memoir containing a biographical sketch of his life.

The monument over the grave was dedicated July 7, 1903, with the members of the Board of Trustees among those present. The memoir, a volume of sixty-four pages, was published and distributed in 1904.

March 22, 1905 (see Item No. 428 in Abstract of Minutes of Board of Trustees 1900–1910), on motion of Dr. H. C. Wood, the balance of the Rice Memorial Fund was accepted as voted by the Revision Committee and the Chairman was requested to appoint a committee of one, to be known as the Rice Memorial Committee, to take charge of this fund and deposit it in the name of the Board of Trustees of the U. S. P. Convention. This motion was carried and the Chairman appointed Mr. S. A. D. Sheppard to constitute the committee.

Under date of November 22, 1910, Dr. A. R. L. Dohme, representing his father, Dr. Charles E. Dohme, the retiring chairman of the Board of Trustees, turned over to Chairman James H. Beal, of the present Board, bank-book No. 55828, of the Boston Penny Savings Bank, with an account, amounting to one hundred and forty-nine dollars and forty-three cents ($149.43) to its credit on October 1, 1910, the same standing in the name of Samuel A. D. Sheppard, Committee of Trustees, of the United States Pharmacopœial Convention.

June 6, 1913, the board of Trustees of the U. S. P. C. inquired of the A. Ph. A. whether the organization would accept the custodianship of the Rice Memorial Fund (U. S. P. C. Board of Trustees minutes, Item 488, p. 365). The Council of the A. Ph. A. voted to accept the Fund in trust.

The transfer was made November 22, 1913, the amount being $168.21.

January 1, 1918, the fund amounted to $178.40.

THE COLLEGE PRIZE FUND (MOTTER FUND).

On August 4, 1905, Dr. Murray Galt Motter, of Washington, D. C., placed in the treasury of the American Pharmaceutical Association the sum of $25.00, the same to be awarded as prizes by the National College of Pharmacy to the members of the classes of 1906–1907–1908–1909–1910 of said College.

This money, deposited in the Boston Penny Savings Bank in the name of the Treasurer of the A. Ph. A., is held as a special fund, to be drawn upon as the prize students shall be named by the National College of Pharmacy and their applications for membership in the American Pharmaceutical Association shall be approved.

Up to the present time no demands have been made on the Fund. January 1, 1918, the Fund amounted to $40.01.

For a detailed account of each of the funds of the Association, see the annual reports of the Treasurer.

HENRY M. WHELPLEY, *Treasurer.*

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ON THE

PROGRESS OF PHARMACY

1916

By HENRY V. ARNY

WITH THE COLLABORATION OF

CHARLES W. BALLARD
KARL S. BURKETT
ZADA M. COOPER
BROOKE J. DAVIS
GEORGE C. DIEKMAN
HERMANN ENGELHARDT
ROBERT P. FISCHELIS
HENRY J. GOECKEL
FANCHON HART
JULIUS A. KOCH
WILLIAM A. PUCKNER
OTTO RAUBENHEIMER
LOUIS SAALBACH
HUGO H. SCHAEFER
CLYDE M. SNOW
JOHN H. WURDACK

INTRODUCTORY

The preparation of the abstracts for this Year Book was made difficult by the absence of practically all journals from Germany, Austria and even from Switzerland. Abstracts from these sources were obtained from English, French and Dutch Journals and notably from "Chemical Abstracts," the editorial staff of which was able to secure sets of the 1916 journals from the Teuton nations. The proper credit is attached to each abstract printed on the pages which follow.

By employment of these aids, the present Year Book is about as comprehensive as its predecessors, as the index and authors' index will show. We have endeavored to make the abstracts as concise as it was possible to produce them without sacrifice of clarity. The list of new remedies is notably complete.

The Reporter on the Progress of Pharmacy desires to express his appreciation of the enthusiastic co-operation of his collaborators, whose names appear above. Thanks to their aid, his work in preparation of this volume was materially lightened.

In closing, he desires to express his sense of personal loss occasioned by the passing of Martin I. Wilbert, a collaborator on the Report on the Progress of Pharmacy since 1911.

PHARMACY

A—General Subjects

PHARMACOPŒIAS AND FORMULARIES.

United States Pharmacopœia.—*Revision Methods.*—H. M. Whelpley, in a paper read before the Colorado Pharmaceutical Association, after discussing pharmacopœias in general from the historical point of view, describes the method employed in revising the U. S. P. IX. He points out the influence of the Food and Drugs Act upon the Pharmacopœia and the scope of the latter. The work of a pharmacopœial convention is given in detail and stress is placed on the importance of the Digest of Comments on the U. S. P. Finally, there are paragraphs on the Board of Trustees of the U. S. P. C., the payment for the use of the U. S. P. text, the pharmacopœial income and expense, proof-reading of the Pharmacopœia and U. S. P. publicity.—Drug. Circ., 60 (1916), 402. (H. H. S.)

Difficulties of Revision.—L. E. Sayre, in a paper read before the Kansas Pharmaceutical Association, discusses the difficulties which arise in bringing about an agreement of the fifty men of the revision committee, on questions of major and minor importance. These difficulties are caused largely because of the various factions in the committee, namely, the technical pharmacologists, practical clinicians, and practical pharmacists. The author states that in his opinion the present Pharmacopœia, when completed, will be one of the most comprehensive and satisfactory of its kind to be found in any language.—Drug. Circ., 60 (1916), 404. (H. H. S.)

United States Pharmacopœia.—*A Safeguard against Adulteration.*—At a joint meeting of the Philadelphia branch of the American Pharmaceutical Association and of the Philadelphia County Medical Society, G. M. Beringer traced the evolution of the pharmacopœia from a book of formulæ to that of a book of standards.

In the act of June 26, 1848, preventing the importation of adulterated drugs, the United States Pharmacopœia was first in the list of authorities, for testing the strength and purity of such drugs. The paper discusses at length the powers of the Pharmacopœia as conferred by the Food and Drugs Act of June 30, 1906, ex-

plaining the responsibility resting upon the revisers of U. S. P. IX, in making it "a law book for the quality of drugs."—J. Am. Pharm. Assoc., 5 (1916), 603.

U. S. P. IX.—*Its Relation to the Newer Pharmacy.*—H. V. Arny points out that U. S. P. IX will be of use only to such pharmacists who are trained to perform high-grade chemical and microscopical work. Such men should use the Pharmacopœia as a means of impressing the medical and lay public with the fact that they possess not merely a knowledge of what is in the Pharmacopœia but also have the ability to do the work laid down therein.—J. Am. Pharm. Assoc., 5 (1916), 989.

U. S. P. IX.—*Chemistry of.*—H. V. Arny, in reviewing the chemistry of the new Pharmacopœia, tabulates the additions under the various headings as: Inorganic—from negative elements and metallic salts; Organic compounds—as aldehyde derivatives, carbohydrates, arseno-organic, phenols, aromatic and purin derivatives, etc.

He calls attention to the rapid change in the titer of tenth-normal barium hydroxide volumetric solution. He believes the deletion of some of the scale salts of iron was unnecessary. He considers that the performance of the chemical work of the Pharmacopœia requires a "real chemist" and that it will be necessary for the retail druggist to be properly trained in college to do chemical work.—Pract. Drug., Sept., 1916, 23. (H. J. G.)

U. S. P. IX.—*Reasons for Some Changes in.*—At a meeting of the Philadelphia branch of the American Pharmaceutical Association, G. M. Beringer read a paper explaining some of the changes made in the recipes for fluidextracts and tinctures. As the information cannot be well condensed, the reader is referred to the original paper.—J. Am. Pharm. Assoc., 5 (1916), 1390.

U. S. P. IX.—*Some of the Changes.*—At the meeting of the New Jersey Pharmaceutical Association, G. M. Beringer discussed the changes and additions in the U. S. P. IX. He points out, among other things, the reasons for digressing from the recommendations of the Brussels International Protocol in the case of such potent drugs as belladonna, aconite and others; notes changes in purity rubic; the addition of microscopical description of certain powdered drugs; changes in assay processes, and extension

of assay processes to other official substances; adoption of such determinations as "Acid Number of Resins," "Determination of Ash," "Boiling Point." He commends the addition of chapters on "Sterilization" and "Diagnostical Reagents and Chemical Tests;" classifies the preparations that have been deleted, notes changes in Latin titles and discusses the adoption of "mil" in place of "Cc."—Am. Drug., 64 (1916), 307. (B. J. D.)

U. S. P. IX.—*Changes Made in.*—At the Richfield Springs meeting of the New York State Pharmaceutical Association, G. C. Diekman, chairman of the association's committee on the U. S. P., pointed out as the five most important changes made in its revision, the following: (*a*) Substitution of the word "mil" for the term "cubic centimeter;" (*b*) change of wording of the monographs from the subjunctive to the imperative mood; (*c*) more positive phraseology of the purity rubrics; (*d*) more exact phraseology of the official definitions; (*e*) the innovations such as descriptions of powdered drugs, official abbreviations, inserting under each official drug and chemical its official preparations and the extension of the scope of the assay processes.—Pharm. Era, 49 (1916), 305.

U. S. P. IX.—*Pharmacy of.*—Geo. C. Diekman reviews the pharmacy of the U. S. P. IX. He commends the introduction of abbreviations and believes the limits of variation in strength in many preparations are too narrow. He questions the advisability of furnishing some of the drugs as powdered extracts, and of directing the filtration of the sediment from fluidextracts.

The deletion of tincture of vanilla, the inclusion of creosote water, solution of zinc chloride, and the working formula for spirit of nitrous ether is questioned.

The assay methods for spirits of camphor and camphor liniment are criticized as being too complex and impractical for general use.—Pract. Drug., Oct., 1916, 23. (H. J. G.)

U. S. P. IX.—*Botanical Nomenclature of.*—E. M. Holmes, in criticizing some of the names adopted by the U. S. P., emphasizes the disadvantages of including botanical synonyms.

The author suggests that the following changes be made, with his reasons for doing so:

Agar.—Derived from species of gelidium in place of Gracilaria lichinoides.

Amygdala dulcis.—Prunus Amygdala dulcis. There is uncertainty as to whether sweet almond should be regarded as a form or variety.

Amylum.—Zea Mays, the source of amylum, is referred to the Nat. Ord. Gramineæ. If uniformity be adhered to in regard to terminations the family would read Graminaceæ.

Aspidosperma.—In this case a non-hyphenated commercial name is used as a specific nomial.

In the cases of bitter orange peel, balsam of Peru, caffeine, calumba, capsicum, clove and squill, Holmes prefers the botanical nomenclature of the British Pharmacopœia to that given in U. S. P. IX.—Pharm. J., 97 (1916), 484. (F. H.)

U. S. P. IX.—*Commercial Possibilities of.*—F. B. Kilmer calls attention to the possibilities of druggists selling copies of the Pharmacopœia to physicians, hospitals, libraries, municipal boards, etc. He advocates the use of the U. S. P. and U. S. P. products for window displays; and of the popularity of the Pharmacopœia by calling attention to the official quality on labels, packages, and various advertisements.—Pract. Drug., Aug., 1916, 24. (H. J. G.)

U. S. P. IX.—*Pharmacognosy of.*—Henry Kraemer discusses the pharmacognostic aspects of U. S. P. IX. He points out that in a work of the character of a pharmacopœia, "willing, practical and thorough-going devotion" on the part of its revisers is a prime essential. He explains the purity rubric and its importance in assuring reliable official drugs; he points out the numerous references in U. S. P. IX to the proper storing of drugs; and he emphasizes the importance of the microscopical descriptions of powdered drugs given in the monography; he quotes the new and special tests now provided for many drugs such as the "ash," "crude fiber," "volatile extractive" tests. In closing he points out the difficulties encountered in selecting proper scientific names for certain drugs and describes some of the controversies that arose out of the question of proper nomenclature.—Pharm. Era, 49 (1916), 387.

U. S. P. IX.—*Changed Alkaloidal Standards of.*—A. B. Lyons points out that while the alkaloidal standards of U. S. P. VIII were rigid (*e. g.*, extract of nux vomica should contain 5 per cent.

of strychnine), the standards of U. S. P. IX permit margins of variation (*e. g.*, extract of nux vomica must contain not less than 15.2 per cent. or more than 16.8 per cent. of total alkaloids). It may be argued with some show of reason that the minimum standard will become the manufacturing standard, but this will be apt to be a dangerous practice, since slight differences in assay methods or else deterioration in galenicals will cause such substandard preparations to become the subject of litigation. To compare the standards of the two pharmacopœias is not always easy, since the basis of standardization has in some cases been changed, as shown in the extract of nux vomica illustrations given above. The paper contains a table of ratios by means of which certain preparations of U. S. P. VIII may be adjusted to the standard of the new Pharmacopœia.—J. Am. Pharm. Assoc., 5 (1916), 1118.

U. S. P. IX.—*English Criticism of.*—E. J. Millard gives a comprehensive review of the Pharmacopœia, describing its salient features and comparing the strength of its galenicals, with those given in the British Pharmacopœia.—Pharm. J., 97 (1916), 366 and 386. (F. H.)

U. S. P. IX.—*Chemistry of.*—E. J. Parry criticizes the U. S. P. IX on the ground that while stress is laid in its Introduction to the legal status of the book, many of the monographs display a looseness of statement not compatible with legal methods. He deplores the fact that while carefully written descriptions of estimations of refractive index and optical rotation are given in the Appendix, in many of the monographs where these means of determining purity are most needed, refractory and polarizing data are missing.—Chem. Drug., 88 (1916), 40.

U. S. P. IX.—*General Formulæ of the.*—Otto Raubenheimer describes interestingly the three general formulæ given in the new Pharmacopœia. These are general directions for making aromatic waters, fluidextracts and tinctures, and the author believes that there should be similar general formulae for other classes of preparations since they save valuable space in the Pharmacopœia by avoiding vain repetition and since they can be easily remembered by students and readily practiced by pharmacists.—J. Am. Pharm. Assoc., 5 (1916), 984.

U. S. P. IX.—*New Galenicals of.*—Otto Raubenheimer discusses the sixteen galenicals introduced into the new Pharmacopœia—sterilized distilled water, cantharides, plaster, rubber plaster, rosin plaster, powdered extracts of aconite, oxgall, gelsemium, hydrastis and viburnum prunifolium, fluidextracts of quebracho and saw palmetto, physiological solution of sodium chloride, magmas of bismuth and of magnesia, oleoresin of parsley fruit and poison tablets of mercuric chloride. He explains the particular purpose of each of these new preparations and outlines the pharmacopœial methods of manufacture.—J. Am. Pharm. Assoc., 5 (1916), 1335.

U. S. P. IX.—*The Preparation of.*—J. P. Remington in a paper read at the meeting of the National Association of Wholesale Druggists discussed the difficulties met and overcome during the ninth revision of the Pharmacopœia, especially those incident to war-time conditions. The labor in preparing the new edition was much greater than that of any previous revision. The author lays stress on the fact that there was not one cent of compensation and no graft. Finally, he reviews the great strides which have been made in chemistry and how important it is to keep the Pharmacopœia up to date. In closing, he states that it remains for those who use the book to pass judgment upon its merits. The Committee of Revision has toiled unceasingly and the verdict so far recorded has been unusually favorable.—Drug. Circ., 60 (1916), 695. (H. H. S.)

United States Pharmacopœia.—*Some Features of the Ninth Revision.*—At the meeting of the American Chemical Society, J. P. Remington read a paper on U. S. P. IX. While dealing chiefly with the chemistry of the Pharmacopœia, Professor Remington stated, among general considerations, that the last was the most difficult revision since 1860, the extra work being largely entailed because of the changed conditions arising from the European war. The paper discusses the use of the word "mil;" the purity rubric; the change in language from the subjunctive "should contain" to the imperative "contains," thus preventing legal quibbles. He also spoke of the diagnostic reagents and biological assays of the revised Pharmacopœia.—Pharm. Era, 49 (1916), 220.

U. S. P. IX.—*Review of.*—H. H. Rusby in great detail reviews the new Pharmacopœia. The article covers seven pages and there are separate chapters on the scope of the Pharmacopœia,

the definitions, the chemical standardization, the microscopical standardization, the biological standardization and unsolved problems.—Drug. Circ., 60 (1916), 534. (H. H. S.)

U. S. P. IX.—*Materia Medica of.*—L. E. Sayre discusses the new edition of the Pharmacopœia pointing out the difficulties in the sub-committee on scope as to additions and deletions, quoting what Dr. Biglow wrote on the same subject in a discussion of the Pharmacopœia of 1850. He tabulates these additions and deletions; discusses at some length the agreements with and deviations from the recommendations of the Brussels conference. He points out such improvements in the new Pharmacopœia as its more accurate descriptions and standards; its directions as to preservation of drugs, its specific drug tests, such as emodin tests and ash determinations. He writes of the biological assays and approves of the average doses given in U. S. P. IX. In closing, he tabulates the changes made in the official galenicals.—Pharm. Era, 49 (1916), 306 and 355.

U. S. P. IX.—*Some New Features of.*—A. Schneider in reviewing the new Pharmacopœia desires to have it understood that in making comments he does not wish to reflect on the ability of the revision committee. He then criticizes various matters in the book, especially those relating to the microscopical examinations of drug, as well as the biological assays. He thinks that to use the Pharmacopœia intelligently, the pharmacist must have adequate courses of instruction in micro-analysis, bacteriology, biochemical assays and urinalysis.—Drug. Circ., 60 (1916), 692. (H. H. S.)

U. S. P. IX.—*Review of.*—W. L. Scoville says the book will be less novel to readers than former revisions have been because of the publicity policy during the course of revision. He comments briefly on: the appendix, the enlarged list of standard reagents, official abbreviations, "preparation" lists, international protocol, the change in purity rubric, descriptions of vegetable drugs.—Bull. Pharm., 30 (1916), 279. (C. M. S.)

U. S. P. IX.—*Therapeutics of.*—The ninth revision of the U. S. Pharmacopœia became official Sept. 1, 1916. It is a book of standards for drugs, but it is not a book of standard drugs. The Pharmacopœia includes substances which have been shown to be inert like the hypophosphites, complex and obsolete mixtures like the

compound syrup of sarsaparilla, and drugs which have been tried and found wanting like saw palmetto berries. There is one great advantage in specifying U. S. P. preparations: to do so, is to invoke legal standards of identity and purity. The only way to be sure of obtaining substances of therapeutic efficiency, however, is to exercise discrimination; the Pharmacopœia is no guide to therapeutically valuable drugs.—J. Am. Med. Assoc., 67 (1916), 750.

U. S. P. IX and N. F. IV.—*Assay Methods of.*—M. I. Wilbert points out that for the first time in this country, fixed maximum as well as minimum requirements are fixed by the Pharmacopœia. Not only must the pharmacist be sure that a drug or preparation is not too weak, but he must also be careful that it is not too strong.

Wilbert further indicates that the Pharmacopœia provides strengths for 85 chemicals, 25 drugs and 82 preparations; while the Formulary gives assays for 22 chemicals, 7 drugs and 23 preparations. Details concerning these, he discusses at some length.—J. Am. Pharm. Assoc., 5 (1916), 1329.

The New U. S. P. and N. F.—*Changes in.*—W. L. Scoville says it will not do now to designate a preparation as "stronger than the official," for since the new standard sets a maximum as well as a minimum strength, the preparation must be within these limits or it is liable to seizure as adulterated and the owner fined. The article reviews some eighteen or more pharmacopœial and twelve or more Formulary preparations which are standardized and comments on the changes.—Pacif. Pharm. (1916), 122. (C. M. S.)

National Formulary.—*Changes in the Fourth Edition.*—W. L. Scoville points out that N. F. IV, like Caesar's "All Gaul," is divided into three parts: that the first part is the Formulary proper; that the second part is a sort of an "extra-pharmacopœia" providing definitions and standards for all simples used in the Formulary that are not accorded pharmacopœial recognition; that the third part consists of special tests and other analytical data taken directly from U. S. P. IX, by permission of the Board of Trustees. The paper is largely devoted to the changes found in Part I of the book.—J. Am. Pharm. Assoc., 5 (1916), 804.

N. F. IV.—*Review of.*—S. L. Hilton emphasizes the endeavor to establish simplicity and uniformity between the National For-

mulary and the Pharmacopœia. A largely augmented index is one of the most commendable features. Attention is directed to the reduced alcoholic and narcotic content of the preparations and the elimination of saccharin. Mention is made of changes in some of the classes and in a number of individual preparations. On the whole, when compared with former editions, the book is scarcely recognizable.—Bull. Pharm., 30 (1916), 280. (C. M. S.)

N. F. IV.—*Revision of.*—E. Fullerton Cook, after giving a brief history of the fourth edition of the National Formulary, discusses it in detail. He points out that throughout the revision the recognized position of the N. F. as an auxiliary to, not a rival of, the Pharmacopœia has been maintained. The committee also held that it should be essentially a book of formulæ and that no "simple" substances should be included which were not used in formulæ. The different classes of preparations are taken up by the author and citicized.—Drug. Circ., 60 (1916), 541. (H. H. S.)

N. F. IV.—*Reaping a Full Harvest from.*—F. M. Apple welcomes the appearance of N. F. IV and feels that the work and money expended upon its preparation should be made to yield rich returns to the American Pharmaceutical Association. As a step in this direction, he urges the immediate preparation of an epitome for distribution among physicians. Such an epitome he believes would serve the two-fold purpose of expounding the merits of the book to physicians and of stimulating the sale of the book itself.—J. Am. Pharm. Assoc., 5 (1916), 1226.

N. F. IV.—*Therapeutics of.*—The fourth edition of the National Formulary does not meet the approval of the American Medical Association. An editorial quotes from the preface to the Formulary: "The scope of the present National Formulary is the same as in previous issues, and is based on medical usage rather than on therapeutic ideals. The committee consists entirely of pharmacists, or of men with a pharmaceutical training, and it cannot presume either to judge therapeutic practice or follow any particular school of therapeutic practice. The question of the addition or deletion of any formula was judged on the basis of its use by physicians and its pharmaceutical soundness. The considerable use by physicians of any preparation was considered sufficient warrant for the inclusion of its formula in the book, and a negligible or diminishing use as justifying its exclusion." "The National Formulary," states the editorial, "contains a large number of for-

mulas for preparations which in the main are complex and superfluous. From the pharmacist's point of view, the book is a valuable one. Physicians who have a scientific training in the pharmacology of drugs will not want it; others will be better off without the temptations offered by its many irrational formulas."—J. Am. Med. Assoc., 67 (1916), 764. (W. A. P.)

Recipe Book.—*Scope and Possibilities of the.*—M. I. Wilbert outlines the history of the Recipe Book of the American Pharmaceutical Association from when it was proposed by H. P. Hynson in 1909 to the present time. Wilbert extols the benefit the collected recipes will be to the drug trade. He believes that the inclusion of recipes for toilet preparations is particularly wise, since pharmacists should not permit this line to go entirely into the hands of the manufacturers, pointing out that while the total value of perfumes and cosmetics made in manufacturing establishments in 1879 was $2,000,000, in 1914 such establishments made $19,000,000 of such products.

Wilbert's paper closes with a bibliography of the recipes published in the JOURNAL from 1912 to date.—J. Am. Pharm. Assoc., 5 (1916), 1121.

EDUCATIONAL PHARMACY.

Commercial Pharmacy.—*Teaching of.*—At a meeting of the New York branch of the American Pharmaceutical Association, R. P. Fischelis discussed the question from the general standpoint and then explained the methods employed by him in his classes. He expressed the belief that commercial pharmacy should neither dominate the instruction given at colleges nor should it be considered merely incidental to the other branches taught. "The greatest mistake," writes he, "that a teacher of commercial pharmacy can make is to ridicule the teaching of the theoretical subjects in the pharmaceutical curriculum and to endeavor to impress upon the student that business practice is paramount in pharmaceutical education." An even greater mistake, he thinks, is for a teacher of the sciences to sneer at the commercial instruction given his students.—J. Am. Pharm. Assoc., 5 (1916), 195.

Commercial Pharmacy.—*How Best Taught at Colleges.*—W. C. Anderson, after outlining the reasons why colleges of pharmacy should give their students commercial training, suggests the following outline of what should be taught in such a course:

The college of pharmacy can and should instruct its students in the proper and successful conduct of the drug store as constituted to-day. The instruction should include buying and selling and the necessary transactions with reference to the same that affect the profits. The rights and obligations of each party to, as well as different forms and characters of contracts, quality of goods purchased, quantity buying, rebates and discounts, bills of lading, bills of sale, bills of exchange, receipts and discharges, should all be given particular consideration.

The care and display of stock, window dressing, service, treatment of customers, handling accommodations and accounts, and system in business should be dealt with in such a way as to impress the student with their importance and to induce him to adopt up-to-date and advantageous methods with reference to the same.

Instruction and practical work in bookkeeping that will enable him to at least keep accurate and complete accounts with those with whom he does business and a correct record of his personal business affairs are absolutely necessary.

Correspondence, insurance in all its different forms, property both real and personal, banking, mortgages, bonds, notes, and deeds, with points of law bearing upon the same, should be given the attention their importance demands. In fact, the course in a college of pharmacy, to be complete, must prepare the graduate to enter upon his life-work fully equipped to avoid the snares of business life, conduct a drug store in a successful manner, and give to the public most acceptable and beneficial service.—J. Am. Pharm. Assoc., 5 (1916), 260. (L. S.)

Commercial Pharmacy.—*The Need of Proper College Training in.*—W. H. Cousins deplores the fact that the average college graduate in pharmacy has traced rare chemicals to their sources, but has never been enlightened on the subject, "How to pay the rent." He believes that the ideal pharmacist is one who is able to make a statement showing July profits with the same ease with which he determines the iodine content of specimen of the tincture. He expresses the hope that in the future, the colleges will provide a system of business education as comprehensive as the scientific education they now offer.—J. Am. Pharm. Assoc., 5 (1916), 698.

Commercial Pharmacy.—*How Can Colleges Best Train Students in?*—In answering the above question in a paper read before the

Section on Commercial Interests at the San Francisco meeting, Henry P. Hynson states, "By equipping them to efficiently render the actual service they will be called upon to render humanity through their customers, while securing for themselves a reasonable competency with protection against unproductive old age." The writer states further that students will certainly not be encouraged to become properly equipped for their life's work if their teachers continually dwell upon the "departed glories" and the present "degradations" into which pharmacy has descended. He pleads for a more thorough commercial training, and states that as a matter of fact neither professional men nor tradesmen are any longer rated merely by their vocational attachments but both are now estimated by standards of competency and worthiness. Colleges of pharmacy should teach business methods because their faculties understand the needs of the pharmacist far better than they are understood by business colleges.—J. Am. Pharm. Assoc., 5 (1916), 141. (L. S.)

Dispensing.—*Teaching at Colleges.*—E. Fullerton Cook states that it is essential for the rounding out of dispensing training that the student be first well grounded in the basic principles of pharmacy, both theoretical and practical and that it is only after this elementary work has been covered that the student is best able to understand prescription filling. He then describes in detail how this elementary work can best be imparted to the average student.—Drug. Circ., 60 (1916), 139. (H. H. S.)

Library Reading Courses.—*Conducted at Colleges of Pharmacy.*—Professor Zada M. Cooper in a paper presented before the Section on Education and Legislation emphasized the fact that students should be compelled to do a certain amount of reading of journals in their particular field, so that by the time they graduate, a habit would have been formed which would stimulate them to continue their education long after the time that they have been recipients of diplomas. Reading is a necessity looked at from the standpoint of dollars and cents. Competition is too keen to make it safe not to know what others are doing. The writer pleads that reading should be made part of a two years' course, even though it be but an hour a week and contends that its practicability in a three years' course is almost a foregone conclusion.—J. Am. Pharm. Assoc., 5 (1916), 43. (L. S.)

Teaching Physiology in Schools of Pharmacy.—H. H. Rusby in a paper read before the American Conference of Pharmaceutical Faculties points out that there are three reasons why physiology should be taught in schools of pharmacy: because the knowledge contributes to the general scientific knowledge; because this knowledge constitutes the basis of the study of hygiene; and finally to furnish the basis for the study of the action and uses of drugs and the nature and treatment of poisoning. The author then goes on to describe what he thinks is the proper method of teaching the subject. He also urges upon the members of the Conference the importance of studying with unprejudiced minds the manner of the presentation of physiology in the syllabus.—Drug. Circ., 60 (1916), 75. (H. H. S.)

The Associations, the Colleges, and the Boards.—W. H. Cousins has written a very interesting paper under the above caption in which he makes the plea that schools and boards should be more practical. Applicant should be taught and required to know the things that will enable him to earn his salary and serve the world in the capacity of pharmacist. He should be taught modern rather than ancient pharmacy. Boards and schools should endeavor to co-ordinate their work and not so much time should be devoted to the teaching of Latin official names, synonyms, part used, of so many vegetable drugs which are practically obsolete. Instead, the wonders of modern serum therapy might be dwelt upon to a far greater extent, as this form of medication is but now coming to its own.—J. Am. Pharm. Assoc., 5 (1916), 144. (L. S.)

Industrial Research in Universities.—In a short article H. K. Benson has outlined what the University of Washington is doing in the line of industrial research. A given industry submits its problem and sets aside a sum of money to establish an industrial fellowship. The work is assigned to a graduate student, who receives a stipend of not less than $500 per annum. Much of his work is allowed to apply on the requirements for an advanced degree. The subjects offered for investigation cover a wide range. Problems dealing with iron and steel, fertilizers, wood preservation, etc., are under investigation, as well as the feasibility of cultivating drug plants along the Pacific coast.—J. Am. Pharm. Assoc., 5 (1916), 409. (L. S.)

LEGISLATIVE PHARMACY.

Legislation Hitting the Drug Trade.—At the meeting of the National Association of Manufacturers of Medicinal Products, J. H. Beal discussed at length the legislative problems affecting the drug trade. He stated that the drug trade must be alert if it is not to be "legislated out of business through the efforts of those good-intentioned but poorly informed persons whose desire to reform the business of other people is usually in direct proportion to their ignorance of the subjects they propose to regulate." He expressed regret that so good and so necessary a measure as the Harrison law had to be a legislative subterfuge.—Pharm. Era, 49 (1916), 105.

Desirable Legislation as an Aid to Maintain Pharmacy.—In a paper read before the Section on Education and Legislation at the San Francisco meeting, J. H. Beal brings out the fact that compromise is the price of progress; that the practical limit set to efforts at reform is to make them fit conditions as they exist with a slant toward conditions as we would like to see them. One of the first steps towards a realization of ideal conditions would be the standardization of all laws pertaining to pharmacy. This might be inaugurated by the drafting of a series of model forms based upon existing laws modified so as to correct those defects which experience has shown to exist; these model forms to be made up by a careful study of existing pattern laws of local, state, and national organizations. In this manner they might be said to represent the best ideas capable of practical realization. The phraseology should be chosen very carefully so that we may be certain that it expresses just what it is desired to express and nothing else. All intended requirements should be made specific. It should not be left to some official bureau to read into the law under the guise of rules and regulations, provisions and requirements which would have been objected to if they had been plainly stated in the original measure.—J. Am. Pharm. Assoc., 5 (1916), 255. (L. S.)

Sanity in Drug Legislation.—J. H. Beal in a paper read before the National Wholesale Druggists' Association discusses the numerous laws and regulations with which the American drug trade has been burdened. He takes up in detail the reformatory legislation, the alcohol question, the habit-forming drug problem and the Harrison law. He thinks a reasonable solution of the greater part of these problems could be found if the legality of the sale were de-

termined by the intent of the seller, the burden of proving the perfect good faith of the transaction being placed on the dealer or dispenser. The author thinks that the present tendencies in legislation represent a condition that constitutes a serious menace to the drug trade in general and suggests co-operation between associations to help the retailer obtain just consideration before law-making bodies. Drug. Circ., 60 (1916), 698. (H. H. S.)

Board Examinations.—*Why Applicants Fail.*—G. M. Beringer, Jr., at the meeting of the New Jersey Pharmaceutical Association, answers this question by giving three printed pages of *verbatim* answers to questions propounded at examinations of the New Jersey board, any one of which is qualified for the comic pages of the daily press. His theory as to the cause of these foolish answers is that the average candidate has been trained to memorize in "poll-parrot" fashion, rather than to reason.—J. Am. Pharm. Assoc., 5 (1916), 857.

Board Examinations.—*Reasons for Failures at.*—R. L. Morland, member of the Minnesota Board of Pharmacy, read a paper at the meeting of the Minnesota Pharmaceutical Association in which he pointed out that the cause of most failures at the examinations of his board arises from the lack of serious preparation on the part of candidates. After young people have wasted valuable time in social enjoyment and outside activities while in college, they appear before that quasi-judicial body, the board of pharmacy, only to be weighed in the balance and be found wanting. Then the disappointed candidate complains of the unfairness of some questions, the difficulty of the examination as a whole, or the objectionable qualities of the examiners as excuses for their ignorance or carelessness. The author supports his contention with samples of absurd answers given to questions propounded by him.—J. Am. Pharm. Assoc., 5 (1916), 745.

Examination Questions.—C. B. Jordan discusses this subject submitting some questions actually asked by board examiners as a proof of his contention that improvement in this direction is needed. He states that the good examination question should fulfil the following requirements: "(*a*) Is it definite? (*b*) Is it practical? (*c*) Is it correctly stated? (*d*) Does it contain or imply any incorrect statement? (*e*) Is it worded best to test the applicant's reasoning power as well as memory? (*f*) Is it one that the applicant does not have a good chance to guess the answer to? (*g*) Have all necessary data been given?"—J. Am. Pharm. Assoc., 5 (1916), 620.

Registration in Pharmacy.—*Classification of.*—L. A. Seltzer makes a plea for more positive standards for assistant pharmacists and registered pharmacists. He believes that the assistant pharmacist certificate should be more freely given and that as a right to gain the real kind of pharmaceutical experience. He feels that the registered pharmacist grade should be conferred only upon those showing technical competence and only to those who have served a certain number of years as assistant pharmacists.—J. Am. Pharm. Assoc., 5 (1916), 1102.

Apprentice Registration.—J. L. Lascoff, in a paper on "The Training of the Pharmacist," points out the inaccuracy of the present method of annually registering apprentices, which causes much trouble to the secretary of the board of pharmacy through unsatisfactory and contradictory statements of pharmacists as to length of service and to failure to report on apprentices.

He enumerates some of the obligations of clerks to proprietors and *vice versa*, and gives some of the shortcomings of proprietors.—Pract. Drug., Aug., 1916, 27. (H. J. G.)

Re-registration Fee.—*A Protest against.*—C. F. Nelson, after describing the meekness of the average druggist in accepting any legislative burden placed upon him, lodges a strenuous protest against re-registration fees demanded in some states each year of those who desire to continue in the practice of pharmacy. His particular objection to this type of law is that usually delinquents are made to take the pharmacists' examination over again.—J. Am. Pharm. Assoc., 5 (1916), 1094.

Another Judicial Perversion of the Statute Law.—H. H. Rusby discusses a recent decision of the Federal court for the Northern District of Illinois in relation to the sale of charlock as mustard. A spice concern sold a mixture of charlock and mustard, but escaped punishment because the court held that charlock is called "wild mustard" and that it is therefore mustard and that a mixture of it and genuine mustard is therefore pure mustard. The author points out the fallacy of this decision and expresses the opinion that it does not seem possible that the judge could have had the facts properly set before him.—Drug. Circ., 60 (1916), 394. (H. H. S.)

Harrison Law.—*Some Results of.*—Dr. H. C. Wood, Jr., discusses the national anti-narcotic law by submitting it to the test

of three questions: (*a*) Is narcomania a peril to the American people? (*b*) Have the beneficial results of the Harrison law counterbalanced its inconveniences? (*c*) How is the best way to combat the narcotic evil?

He answers the first two questions in the affirmative stating that Philadelphia wholesalers report a diminution of 50 per cent. or more in narcotic sales of 1915 when compared to the sales of 1914. As to the third query he thinks education of the public in the evils of narcotic addiction, education of the physician to the dangers of too ready recourse to the hypodermic needle and education of the pharmacist to the fact that narcotic cough mixtures develop drug fiends are essential factors.—J. Am. Pharm. Assoc., 5 (1916), 1205.

Stevens-Ayers Bill.—At a meeting of the Washington branch of the American Pharmaceutical Association, J. L. White read a paper on the price-maintenance bill bearing the name given above, pointing out its advantages and the great need of preventing price-demoralization by such a measure.—J. Am. Pharm. Assoc., 5 (1916), 77.

Quality of Medicines.—*Variation in Purity and Strength a Vexation and a Menace.*—In the Public Health Reports, M. I. Wilbert discussed the variations in the quality of medicines. He quotes statistics showing that some 27 per cent. of medicines examined during 1914 were found to be either under or over strength; he points out that if a patient is given one time a potent tincture that is 20 per cent. below strength, and is then given a tincture of the same medicine that is 30 per cent. above strength, serious results may ensue. He claims that the quality of goods secured from the small retailer is poorer than that obtained from the wholesaler. He expresses the belief that careless storing is largely the cause of this condition, and urges the education not only of the druggist but also of the public to the importance of the proper enforcement of drug laws.—Pharm. Era, 49 (1916), 351.

Metric System.—*Advantages of.*—Dr. A. L. Benedict, after quoting a newspaper writer who called the European War "the war of the metric system," expresses the opinion that much of the remarkable efficiency of Germany may be ascribed to its willingness to throw over the cumbersome units of the old system and to adopt the metric system. The paper emphasizes that all questions relative to weights are settled in Germany upon one

standard or the decimal multiples or fractions thereof; that in measurement instead of having degrees and miles and chains and links and acres and yards and feet and inches—everything from the degree of latitude to the minutest particular of house furnishing—the Germans deal with decimal multiples or fractions of the same unit.—N. Y. Med. J.; through J. Am. Pharm. Assoc., 5 (1916), 852.

A Metrical Tragedy.—The value of the metric system as a time-saver is strongly emphasized by Dr. J. V. Collins in a paper bearing the above title. He points out the necessity of using the metric system in South American trade and refers to the ignorance on the part of most people of the simplicity of the metric system. According to the author, the metric system is not needed merely for foreign trade but for domestic transactions as well. It is necessary for the sake of efficiency.—Scientific Monthly; through Am. J. Pharm., 88 (1916), 147. (R. P. F.)

Metric System.—*How to Use It.*—J. W. England in a paper read before the Pennsylvania Pharmaceutical Association points out that the only way to use the metric system of weights and measures is to think in terms of the metric system and that then the system becomes surprisingly simple in operation. The metric system was legalized by Congress in 1866. It is used in our coinage. Metric units are the legal units of electrical measure in the United States. Many more facts are mentioned showing the great strides in the use of the metric system. He then gives a few suggestions in the right way of using the metric system particularly in the manufacture of pharmaceutical preparations.—Drug. Circ., 60 (1916), 478. (H. H. S.)

Back to the Chemist's Shop.—C. Ferdinand Nelson urges pharmacists to take cognizance of the fact that the profession of medicine is marching onward at a tremendous rate and that pharmacy, in order to come into its own, must keep step with medicine. He suggests that the modern pharmacists discard many of the unprofessional side-lines and take up bacteriological and chemical work to a greater extent. He outlines a series of tests which can be made by the pharmacist with profit to himself and to the professional standing of pharmacy.—Am. J. Pharm., 88 (1916), 246. (R. P. F.)

Municipal Chemist.—*Opportunity for the Pharmacist.*—C. F. Nelson advocates checking the inroads made by commercialism on professional pharmacy by having pharmacists use their knowledge of chemistry and bacteriology for financial gain by establishing testing laboratories as side-lines. He feels that no other individual is better situated to become the chemist and bacteriologist of his municipality than the pharmacist and concludes as follows: "If the pharmacist spends as much energy developing a department of this sort as he frequently does in selling sundries, his returns for analyses other than those done for the municipality will yield him far greater revenues."—Am. J. Pharm., 88 (1916), 146. (R. P. F.)

The Pharmacist and the State.—C. F. Nelson in a paper read before the Kansas Pharmaceutical Association discusses the question as to what relations do professional men and women have toward the State in which they live and labor, and, in turn, what is the State's relationship to them? He points out that after the pharmacist has met all requirements regarding preliminary education, experience, etc., he must still pay an annual fee and re-register or automatically become disqualified.—Drug. Circ., 60 (1916), 335. (H. H. S.)

Pharmacy in America.—*Future of.*—C. F. Nelson asks whether pharmacy has kept pace with medicine and answers the question in the negative. While State board examinations are becoming more exacting each year, retrogression has obtained in retail pharmacy.

As remedies he suggests: First, the pharmacist must keep pace educationally with the physician whose preliminary trainings should be equal; second, the professional or technical equipment of the pharmacist must be as broad as that of the physician, although of a different character; third, schools of pharmacy must in the future be as courageous as most schools of medicine are at present. Their aim must not be to fill the demands of the commercial market for retail drug clerks, but they must rather concentrate their energies on producing a few highly trained pharmacists.—Am. J. Pharm., 88 (1916), 65. (R. P. F.)

HISTORICAL PHARMACY.

Scientists.—*Records of.*—The task of gathering records concerning the lives of 1258 deceased men of science has been under-

taken by Prof. Blanchard, of the Paris Faculty of Medicine.—Chem. and Drug., 88 (1916), 585. (K. S. B.)

Teachers of Pharmacognosy.—*Biographies of Pioneers in America.*—Henry Kraemer publishes an article in which he gives interesting biological sketches of Dr. Samuel Jackson, Dr. Benjamin Ellis, Dr. George B. Wood, Dr. Robert E. Griffith, Dr. Joseph Parson, Dr. Robert P. Thomas, Edward Parrish, John M. Maisch and Edson S. Bastin. The article is illustrated by full-page portraits of the eight first named.—Am. J. Pharm., 88 (1916), 385 and 433.

Apothecary's Concession.—*Description of One Granted in 1796.*—Another of the highly interesting "Historical Fragments" published by Edward Kremers relates to a concession granted to Ignaz Biechele by the Bishopric of Eichstædt. The article outlines the history of the bishopric as a clerical state of the Holy Roman Empire from 745 until its secularization in 1802. The document conferring the concession, which is now the property of the University of Wisconsin, is reproduced, and the printed German version and English translation are given in parallel columns.—J. Am. Pharm. Assoc., 5 (1916), 1243.

Pharmacy.—*Origins of.*—Lawrence Irwell gives historical sketches of "The Origin of Profession of Pharmacy" from 1133 A. D. on, describing some of the formulæ in use. He describes the drugs mentioned by Shakespeare, and the references to pharmacy and alchemy made by Gœthe and Dumas, the Elder. He compares some of the beliefs and fictions found therein with some of the therapeutical claims advanced in recent years.—Pract. Drug., Apr., May, June, 1916, pp. 25, 27, 25. (H. J. G.)

Apothecary's Oath.—An interesting item by Dr. Dorveaux in the "Bulletin des Sciences Pharmacologiques" gives the origin, history and obligations of the "Oath of Christian Apothecaries, fearing God" which was to the pharmacist, what the "Hippocratic Oath" was to the physician. It is translated from the French and is well worth perusing.—Am. Drug., 64 (1916), 219. (B. J. D.)

Pharmaceutical Contributions.—John Uri Lloyd gives a description of his introductory pharmaceutical contributions which appeared in 1870 and thereafter, dealing with the revision of cer-

tain preparations in the American Dispensatory. He traces the change from the polypharmacy of that period to the simplified preparations more in vogue to-day.—Pract. Drug., Feb., 1916, 22. (H. J. G.)

Old Recipes.—Some old formulæ are published by F. Goldby that were discovered some years ago by F. C. E. Jessopp, solicitor and clerk to the magistrates of Waltham Abbey, Essex. The following is a typical recipe dated January, 1720:

"*Surfeit Water.*—Take a quart of the best canary sack and a quart of the best anniseed water; rub 'em to a gallon of red poppy buds; cover 'em with and set 'em in a cellar two or three days; then strain it out and put thereto an ounce and half of liquorice and an ounce and half of anniseed and let it stand two or three days longer; then strain it out and bottle up with a quarter of a pound of sugar candy and two large nutmegs sliced."—Pharm. J., 97 (1916), 521. (F. H.)

Evolution of the Pharmacist.—At a meeting of the Glasgow and West Scotland Chemists' Association, Col. Ralph Stockman discussed the history of pharmacy from the early Aryans on, citing the Babylonians as the first to recognize the relation of capacity to weight; the Jews as the possessors of a remarkable sanitary code; the Greeks and their priest-physician, Hippocrates; the Romans, with their various drug shops; the Arabs and their medical school founded in Bagdad in A. D. 754; the then discussed pharmacy in Europe during the twelfth to fourteenth centuries. Turning to pharmacy in Great Britain, he described the pepperers and spicers of the twelfth and thirteenth centuries and the grocer-druggists of the fourteenth century. He spoke of the first London Pharmacopœia of 1618; and the founding of the first British association of druggists in 1795.—Pharm. J., 97 (1916), 501 and 542. (F. H.)

The Old Glasgow Pharmacist.—A compilation of the patent medicines most popular in Glasgow in the early part of the 18th century and some interesting data concerning old Glasgow druggists, is given in a paper entitled "Sidelights on Glasgow Pharmacy in the Olden Times," by J. P. Gilmour, M. P. S.—Pharm. J., 97 (1916), 3. (F. H.)

Hager Centenary.—In commemoration of the birth on January 3, 1816, of Dr. Hermann Hager, the master of pharmacy,

The New Yorker Deutscher Apotheker Verein held a Hager Abend, at which the following papers were presented: "The Life of Hager," by Emil Roller; "Hager as Pharmaceutical Author," by Otto Raubenheimer; "Hager as Chemist," by F. Klein; and "Reminiscences of Hager," by G. Drobegg. These papers are published in full in the Hager Number of "Deutsch-Am. Ap. Ztg.," 1 (1916), 141. Other tributes paid to Hagar were: "The Centenary of Hermann Hager," editorial with photograph, "J. Am. Pharm. Assoc.," 5 (1916), 3; "Hermann Hager's Centenary," by Otto Raubenheimer, "Drug. Circ.," 60 (1916), 6; "In Memory of Hermann Hager," "Sudd. Apoth. Ztg.," 1 (1916), 1. (O. R.)

WOMEN IN PHARMACY.

Druggists' Wives.—*Influence They Can Exert on Public Health.* —Mrs. J. M. Bladen believes that the druggist's wife in co-operation with the doctor's wife can do much, in the home and in the club, in the educational campaign in behalf of antisepsis and prophylaxis.—J. Am. Pharm. Assoc., 5 (1916), 203.

Women in British Pharmacy.—An article stating the position of women in British pharmacy, and containing a description of Henry Deane's pharmacy, which is at present being operated by women, is given in "Chem. and Drug.," 88 (1916), 790. (K. S. B.)

Should Women Study Pharmacy?—Miss Anna G. Bagley discusses the advantages and opportunities of a pharmaceutical training for the young woman, comparing pharmacy as a vocation with other callings open to women.—Am. Drug., 64 (1916), 309. (B. J. D.)

Woman in Her Own Pharmacy.—Daisy A. Frick points out that when a woman pharmacist does not manage her own home, she is able to shine in the pharmacy which she conducts. She claims that there are many phases of the store routine in which a woman is superior to a man. Among these she cites the prescription department, where neatness and deftness are almost as essential as accuracy; the rubber goods department with its many women patrons; the stationery department where the feminine judgment is needed; the toilet goods case in which a woman has more personal interest than has a man; the soda fountain where a woman's eye for cleanliness is more acute than is a man's. She even feels that a woman can train herself to handle the cigar

patronage better than a man does.—J. Am. Pharm. Assoc., 5 (1916), 701.

Women in Hospital Pharmacy.—In a paper read before the Women's Section at the San Francisco meeting, Bertha Ott brings out the fact that in ancient times it was quite common to find women physicians, nurses and "sisters" in hospital practice, who prepared medicines. Historical references seem to indicate that at least as early as 660 A. D. women were quite prominent in hospital pharmacy. From that time up to the twelfth century such conditions seemed to exist, but from that time the position of women in medicine and pharmacy slowly declined and practically disappeared after the sixteenth century, and was not revived until the early part of the nineteenth century. The writer makes the plea for more women pharmacists in hospital service, this being the field that, unless conditions are remedied in general pharmacy, will rank first in upholding the ethical side of the profession.—J. Am. Pharm. Assoc., 6 (1916), 590–592. (L. S.)

GEOGRAPHIC PHARMACY.

Pharmacy in Spain.—An interesting account of a vacation in Spain contains much information concerning pharmacy and pharmaceutical customs in Spain.—Chem. and Drug., 88 (1916), 160. (K. S. B.)

English and French Pharmacy.—English and French pharmacies are contrasted in an interesting manner by V. Renneboog.—Chem. and Drug., 88 (1916), 142. (K. S. B.)

Pharmacy in Turkey.—A. G. Vlamos describes pharmaceutical conditions in Turkey prior to the war. There were then five schools of pharmacy in the empire, three being governmental institutions, one being French and one American. Practically no preparations and chemicals were made in Turkey, most pharmaceuticals coming from Germany. The French Codex of 1884 is still the official standard. The article closes with a description of the pharmacy school of the Syrian Protestant College of Beyrout which is an American missionary institution.—Chem. and Drug., 88 (1916), 476.

COMMERCIAL PHARMACY.

Advertising the Retail Drug Business.—At a joint meeting of the Baltimore branch of the American Pharmaceutical Association and of the Baltimore Retail Druggists' Association, J. T. Lyons read a paper on advertising in which he pointed out that advertising does not necessarily mean bill-boards, street cars or newspapers, but that almost every waking hour the retail druggist is advertising or *mis*-advertising his business. His ideas as to best methods of advertising are well worth careful study.—J. Am. Pharm. Assoc., 5 (1916), 83.

Advertising.—The keynote of a paper on advertising read before the Section on Commercial Interests at the San Francisco meeting by W. C. Alpers may be summed up in the single word "individuality." Says the writer, "If you would adopt advertising as a means of improving and increasing your business, you must not do it in a haphazard manner. Have a fixed object in view. Lay out a plan for a whole year. Follow it up strictly and persistently. Do not be discouraged by seeming failures, and, above all, put all your efforts and all your individuality into this work."—J. Am. Pharm. Assoc., 5 (1916), 265. (L. S.)

Business Methods.—*A Plain Talk on.*—In a paper presented to the Section on Commercial Interests at the San Francisco meeting B. E. Pritchard brought out the fact that one of the reasons why we do not obtain much-needed legislation is because, as a class, pharmacists when called upon to interview or write to legislators, invariably seem to depend on "the other fellow" to do what they themselves neglect. Comments are also made upon the evils of price cutting and on one of the Harrison anti-narcotic bill rulings. The author closes with the comment, "It is strict attention to the needs of your customers and quality of service that bring and hold trade."—J. Am. Pharm. Assoc., 5 (1916), 596. (L. S.)

Chemicals.—*Buying of.*—At the meeting of the Minnesota Pharmaceutical Association, Max Menzel read a paper pointing out the care necessary in buying chemicals and pharmaceuticals. He advises purchase of small quantities of chemicals in original containers, except in cases of staples such as sulphur, copperas, Epsom salt, etc. The type of container is an important item, pasteboard cartons being inadvisable in the case of a large number of

chemicals. Only enough botanic drugs to last a year should be purchased.—Pharm. Era, 49 (1916), 153.

Cigars.—*A Profitable Side-Line.*—A very interesting paper was presented by S. A. Eckstein to the Commercial Section at the San Francisco meeting on the sale of cigars as a side-line. The author takes up the subject in a comprehensive manner. He lays stress upon the kind of cigars to sell and how to promote their sale; defines clearly and plainly the various trade methods of designating by colors; discusses the proper method of storing, displaying and advertising.—J. Am. Pharm. Assoc., 5 (1916), 46. (L. S.)

Galenicals.—*For Combating War Prices.*—At a meeting of the Philadelphia branch of the American Pharmaceutical Association, R. P. Fischelis read a paper on the subject of the high prices of drugs and chemicals due to war conditions and suggested that pharmacists, in acquainting their medical patrons with this condition, use their influence in getting the latter to prescribe less expensive drugs or preparations having similar therapeutic action. He points out that the therapeutic index found at the back of each of the two leading dispensatories gives very valuable suggestions in this direction. He also urges the pushing by pharmacists of galenical preparations of drugs rather than their alkaloids, which are now very expensive.—J. Am. Pharm. Assoc., 5 (1916), 411.

Modern Merchandising.—At the meeting of the Illinois Pharmaceutical Association, H. B. Mason gave an address in which he emphasized the importance of location, courtesy and service in the success of any drug store. The article abounds in interesting illustrations as to how and how not a drug store should be conducted.—Pharm. Era, 49 (1916), 267.

Moth Balls.—*Sale of Eight Barrels.*—In a very interesting manner the above-named sale is described in detail by William J. Lowry, Jr., in a paper read before the Commercial Section at the San Francisco meeting. The generous use of catchy signs and full value for the money spent formed the keynote of the success of the sale. The writer gives the wording of the signs and a lot of other interesting details which might well be adopted by others. —J. Am. Pharm. Assoc., 5 (1916), 51. (L. S.)

Non-Secret Remedies.—*An Appeal for a National Line.*—D. N. Robin and T. D. Wetterstroem present two papers urging the organization of a commission of retail druggists to pass on non-secret preparations submitted to it by individual manufacturers. Those accepted by the commission could then be marketed bearing the approval of the commission, thus giving the meritorious preparation the advertising value of such approval. Both writers believe that the creation of such a commission is a proper function of the American Pharmaceutical Association. Wetterstroem feels that the line of non-secrets should be limited to household remedies, veterinary preparations, toilet articles and technical preparations. —J. Am. Pharm. Assoc., 5 (1916), 695.

Profits.—*Source of.*—"Profit in business may be materially influenced by failure to take into account the small items of expense," says A. S. Parker in a paper read before the Section on Commercial Interests at the San Francisco meeting. The writer then points out many so-called small items which in a month or a year eat a large hole into the profits of the business. Some of the items to which he calls attention are the items of expense such as gas, electric light, coal, ice, small repairs, the buying of new pestles when the old ones could easily have been repaired, the buying of spatulas instead of taking a few minutes time to grind down many of the broken ones. The sale of waste paper and old bottles is likewise mentioned. Numerous concrete illustrations are given as to how large successful corporations watch the little things. Lack of knowledge of current prices is aptly illustrated by a telephonic inquiry addressed to a number of druggists for the price of hydrastis, which brought replies ranging all the way from five cents to thirty cents an ounce when the drug was being jobbed at $2.75 a pound. The selling of "running mates" with an article called for was also brought out in the course of the discussion which followed the reading of the paper.—J. Am. Pharm. Assoc., 5 (1916), 593. (L. S.)

Pharmaceuticals.—*Cost of Manufacture of.*—E. A. Sennewald points out the financial advantage of making pharmaceuticals in the drug-store laboratory and ridicules some of the arguments advanced against such a practice. He inclines to the opinion that the unsatisfactory condition of the drug business of to-day is largely due to the fact that not enough laboratory work is done in the drug store.—Meyer Bros. Drug., 37 (1916), 363.

Preparations.—*Sale of Own Make.*—"Your own preparations afford an opportunity for excellence and individuality," says F. W. Connolly in a paper read before the Commercial Section at the San Francisco meeting. Goods made by the pharmacist can be recommended with greater confidence than those that are advertised. The writer recommends that satisfaction be guaranteed or money refunded, as in this way the confidence of the purchaser is gained. He also states that the finished package must be such as will appeal to the customer. Of popular articles such as cough syrups, ointments, etc., it pays to have several kinds.—J. Am. Pharm. Assoc., 5 (1916), 49. (L. S.)

Prescription Pricing.—*Need for More Careful Study of.*—Mason and Perry presented at the Atlantic City meeting of the American Pharmaceutical Association a detailed study of prescription pricing by the average druggist. They find that the average druggist has no idea of the cost of compounding a prescription, thereby oft-times compounding a prescription at a loss. They contend that the practice of using a flat rate for prescription, such as 30 cents for 2-ounce mixture, 40 cents for 3-ounce mixture, etc., or by the size of the dose is unscientific and fundamentally wrong. They find that many druggists are not charging any more for prescriptions than they did fifteen or twenty years ago, and that the druggist must take into consideration the effect of the war on prices of materials. They advocate the use of the Evans rule, *i. e.*, "Get a profit approximately 100 per cent. on cost of bare material and container, and charge a dollar an hour for actual time consumed in compounding."—Am. Drug., 64 (1916), 357. (B. J. D.)

Prescription Pricing.—At a meeting of the Detroit branch of the American Pharmaceutical Association, W. M. Chase presented a paper on "Prescription Prices in Detroit," giving a compilation from over twenty stores. He finds that the prices approximate those obtained by the Evans rule, *i. e.*, double the cost of the ingredients, plus charge for container, etc., and $1.50 an hour compounding charges. He found the following range of prices on prescriptions with no expensive ingredients: 1 fl. oz. 25 to 40 cents; drop doses to 50 cents; average 35 cents. 2 fl. oz. 35 to 50 cents; average 40 cents. 3 fl. oz. 40 to 60 cents; average 50 cents. 4 fl. oz. 60 to 65 cents; 3 claimed to get 75 cents; 2 to get 50 cents; one 40 to 45 cents. One considered 75 cents the correct price but charged 60 to 65 cents, evening up the average by getting

50 cents for all 2 and 3 fl. oz. prescriptions. 6 fl. oz. 75 to 90 cents. 8 fl. oz. 85 to $1.25, average $1.00. 16 fl. oz. $1.25 to $2.00. 12 powders 25 to 60 cents; average 40 to 45 cents. 12 capsules 25 to 75 cents; average 50 cents.—Pract. Drug., Jan., 1916, 28. (H. J. G.)

Window Displays.—At the meeting of the New York State Pharmaceutical Association, J. L. Lascoff discussed window displays appropriate for drug stores, dividing same into four classes: those used by a large system of chain stores; those appropriate for a semi-professional pharmacy; for the strictly professional pharmacy; and for the small store in an unfashionable neighborhood. He states that rent with display windows is rated at 25 per cent. more than the same floor space without such windows. At the same meeting, Miss L. Leiterman read a paper on window-dressing, giving examples of effective ways of displaying goods.—Pract. Drug., Nov., 1916, 34. (H. J. G.)

DISPENSING PHARMACY.

Dispensing.—*The Real and the Ideal in.*—L. E. Sayre emphasizes the necessity of the pharmacist encouraging the efforts of the Pharmacopœia, the National Formulary, New and Non-Official Remedies and the A. Ph. A. Recipe Book toward uniformity in medicaments. He feels that the sale by pharmacists of fraudulent nostrums, simply because they are largely advertised, is a bad thing for the calling.—J. Am. Pharm. Assoc., 5 (1916), 1332.

Uniformity in Dispensing.—J. Leon Lascoff calls attention to the changes in the new Pharmacopœia and National Formulary pointing out 28 changes in U. S. P. recipes and 73 changes in preparations of the Formulary. In "repeat" prescriptions these changes are apt to cause embarrassment and he suggests the use of a small label, pointing out that the medicine in the container has been prepared according to the recipe in the new Pharmacopœia. He also expresses surprise at the different sizes of pills and suppositories dispensed on the same prescriptions by different pharmacists. The paper has an illustration showing these differences.—J. Am. Pharm. Assoc., 5 (1916), 1112.

Prescriptions.—*Use of English Advocated.*—B. Fantus favors the abandonment of the so-called "Latin" prescription. He holds

that the usual arguments in favor of the "Latin" prescription are fallacious and points out the advantages of the use of English. He concludes: "By far the most important reason for writing prescriptions in English lies in the difficulty medical students have in learning the Latin form. To the student prescription writing is a bugbear. When one thinks of the crowded medical curriculum and the comparatively small number of hours set aside for pharmacology and therapeutics, it seems a pity to waste any of it on the acquiring of an antiquated form of expression." In regard to the claim that Latin prescriptions guard a patient from knowledge which might be prejudicial, he replies: "Inasmuch as it is the popular opinion that doctors use Latin in prescription writing to keep the laity in ignorance for selfish ends, it seems high time that we antagonize this idea; and we can do this most emphatically by using English. This we can also do with perfect safety, for secrecy is very rarely, if ever, essential in the practice of the up-to-date physician, who generally prefers to take his patient into his confidence than to keep him in ignorance. Deception is not practiced by the true physician. Therein lies the special difference between the quack and the honest medical man."—J. Am. Med. Assoc., 66 (1916), 1696.

Prescription Writing.—*Propaganda for.*—Jacob Diner explains the prescribing of nostrums by physicians as arising from ignorance, on the part of physicians, of the fundamental principles of pharmacology. He proceeds to describe the methods employed by the Bronx County Pharmaceutical Association in carrying out a campaign in behalf of legitimate prescribing. These methods include: (*a*) joint meetings of physicians and pharmacists at which prominent pharmacologists talk on a certain topic (*e. g.*, digestives, cathartics, etc.); (*b*) mailing to physicians a pamphlet containing these lectures in abstracted form; (*c*) sending samples germane to the topic discussed in the preceding pamphlet.—J. Am. Pharm. Assoc., 5 (1916), 1219.

Prescriptions.—*Furnishing Copies of.*—At the meeting of the New York State Pharmaceutical Association, Otto Raubenheimer recommended the making of the following notation on prescriptions on file, copies of which have been given: "Copy given on such a date." He discourages giving copies of prescriptions on pieces of paper, which do not bear the name or address of the druggist giving the copy.—Am. Drug., 64 (1916), 314. (B. J. D.)

Prescription Incompatibilities.—A. W. Linton discusses a number of incompatibilities; among them combinations of aspirin in solutions and also of aspirin and euquinine in powder or capsules which form a firm but moist mass. He suggests as remedy the placing of the aspirin in a smaller capsule which is then inserted in a larger one containing the euquinine or into cachet containing the latter substance. He finds the addition of drying powders, such as starch althæa, etc., overcomes the tendency of aspirin to become deliquescent when dispensed in powders.—Pacific Drug Review; through Pract. Drug., Oct., 1916, 34. (H. J. G.)

Prescription Incompatibilities.—*In Theory and in Practice.*—In a very interesting article, J. P. Gilmour discusses incompatibilities as they influence the relations between dispenser and prescriber. Prior to the European war a joint committee of the British Pharmaceutical Conference and the British Medical Society had under consideration a code of rules for the guidance of prescribers and dispensers but though the enterprise seemed promising it is now indefinitely deferred. The proposed code contained some rules dealing with prescription incompatibilities.

Because no one can predict precisely the action of any compound on the human organism the author concludes that except in the rare cases where physiological incompatibility can be demonstrated, the pharmacist need not consider the prescriber's motives or be concerned about therapeutic results; "it is the duty of the dispenser to compound the prescription as presented unless the products of interaction are dangerously toxic." He thinks that, perhaps, the majority of the English public believe that a medicine must be "nasty in taste and appearance" to be effective, so he would not interfere with a formula for purely esthetic reasons. He then offers a classification, suggesting the pharmacist's duty:

I. Insoluble substances are not necessarily contra-indicated, *e. g.*, calomel or bismuth salts. The dispenser need only be sure of uniform dosage.

II. Substances theoretically chemically incompatible may be reconverted in the body. Cocaine hydrochloride precipitated as alkaloid when ingested becomes available in its original form, although sometimes the toxic nature puts cases like this in Class V. If not the dispenser's responsibility extends only to accurately divided dosage.

III. The product of incompatibles may have therapeutic prop-

erties similar to the original substances, *e. g.*, mercuric chloride with potassium iodide gives mercuric iodide which is still antisyphilitic. The line of demarcation between this and I and II is very slight.

IV. The product of incompatibles may have properties dissimilar to those prescribed or be physiologically antagonistic, *e. g.*, sulphurous acid and hydrogen dioxide or tincture of opium and potassium permanganate. In these specific cases, Mr. Gilmour would consult the prescriber but in many of this class he thinks "it is wiser to adopt the policy of Brer Rabbit, 'to lie low, and say nuffin'."

V. Poisonous substances may result or the precipitation of an alkaloid may make communication with the prescriber imperative. —Pharm. J., 96 (1916), 43. (Z. M. C.)

Prescription Incompatibilities.—At a meeting of the New York branch of the American Pharmaceutical Association, J. C. Wolfe and J. L. Lascoff presented twenty-five prescriptions of unusual interest, some of which represented marked difficulty in compounding. They were discussed in detail by Dr. Henry P. Hynson and others. Copies of the prescriptions, with discussion, are included in the report of the melting.—Am. Drug., 64 (1916), 215. (B. J. D.)

Homœopathic Pharmacy.—H. E. Chapman describes homœopathic pharmacy as practiced in England. He points out that the symbol for the 10 per cent. mother tincture is "ϕ" and that the dilutions are termed $1x$, $2x$, $3x$, etc. He also notes the use of attenuations of tuberculin and vaccines, sugar of milk being the diluent.—Chem. and Drug., 88 (1916), 19.

Official Remedies.—*Interesting Physicians in.*—William H. Blauvelt in a paper presented at the North Carolina Pharmaceutical Association after describing some of the advantages in making one's own galenicals tells how official remedies were "pushed" in his home town. At the beginning of the campaign 50 per cent. of all prescriptions called for proprietaries. To-day 10 per cent. would cover them.—Drug. Circ., 60 (1916). (H. H. S.)

Office Dispensing.—*Relation to the Retail Drug Trade.*—At the meeting of the Wisconsin Pharmaceutical Association, O. J. S. Boberg discussed the problem of the dispensing physician advocating that druggists should endeavor to supply dispensing physicians with the pharmaceuticals which they require; call to

their attention the splendid formulæ contained in the National Formulary and occasionally offer to make samples of the U. S. P. and N. F. preparations.

He thinks that "if the druggist who bewails his lost prescription business and denounces the dispensing doctors, would stop to think, he would soon discover the chief causes why physicians dispense are, ... the persistent work of travelling representatives of the supply houses and.....the druggist's own gradual withdrawal from the professional side of pharmacy."

"By looking over the contents of the shelves in the average drug store it appears that more time is being spent by some druggists listening to travelling men and loading up on ready-made compounds.....than there is time spent by the same druggists in making U. S. P. or N. F. galenical preparations. A reversal of this would soon prove beneficial in bringing doctors and druggists near together."—Pract. Drug., Nov., 1916, 30. (H. J. G.)

The Co-operation of Medicine and Pharmacy.—*Need of Activity in This Direction.*—At the joint session of the National Association of Boards of Pharmacy and of the American Conference of Pharmaceutical Faculties at San Francisco, J. P. Remington read a paper urging the co-operation of physicians and pharmacists in improving the status of both callings. He believed that the pushing of proprietary medicines by druggists drove a large number of physicians to dispensing their own medicine and he characterized the prescribing of "ethical proprietaries" by physicians as detrimental to both pharmacy and medicine. He believed that propaganda in behalf of U. S. P. and N. F. preparations is the best way to secure co-operation.—Pract. Drug., Feb., 1916, 42.

Physicians and Pharmacists.—*Relieving Differences between.*—P. H. Utech states that physicians think that pharmacists charge too much for prescriptions calling for ready-made tablets and pills. The physician, however, forgets the many factors aside from the price of the ingredients that enter into the actual cost of the prescription.

Utech cites the investigation of the Colorado Pharmaceutical Association as to the actual cost of a prescription and then suggests as a remedy for this and other misunderstandings of the physician and pharmacists, get-together meetings, preferably the pharmacists as a society inviting the physicians as a society to a banquet,

after which each side could tell its story through one of its members. Such gatherings would be of considerable benefit to all concerned and would lead to a better understanding all around. Among the other differences mentioned as occurring between physicians and pharmacists may also be mentioned the practice which some physicians have of telling the patient the probable cost of the medicine. A case of this kind upon investigation brought out the fact that the physician based his estimate of the probable cost of a prescription on a price list which proved to be three years old, the actual price in this particular instance being more than double that named by the physician.—J. Am. Pharm. Assoc., 5 (1916), 263. (L. S.)

MISCELLANEOUS.

Meteorological Work.—*Suggested Avocation for Pharmacists.*—Acceptance of the position of public meteorologist by pharmacists is urged by W. Pilkington in an article in which he points out many of the advantages obtained through such work. It is a pleasant recreation for the pharmacist and is the source of much good advertising. He describes the work and gives some weather change indications with their portent.—Chem. and Drug., 88 (1916), 794. (K. S. B.)

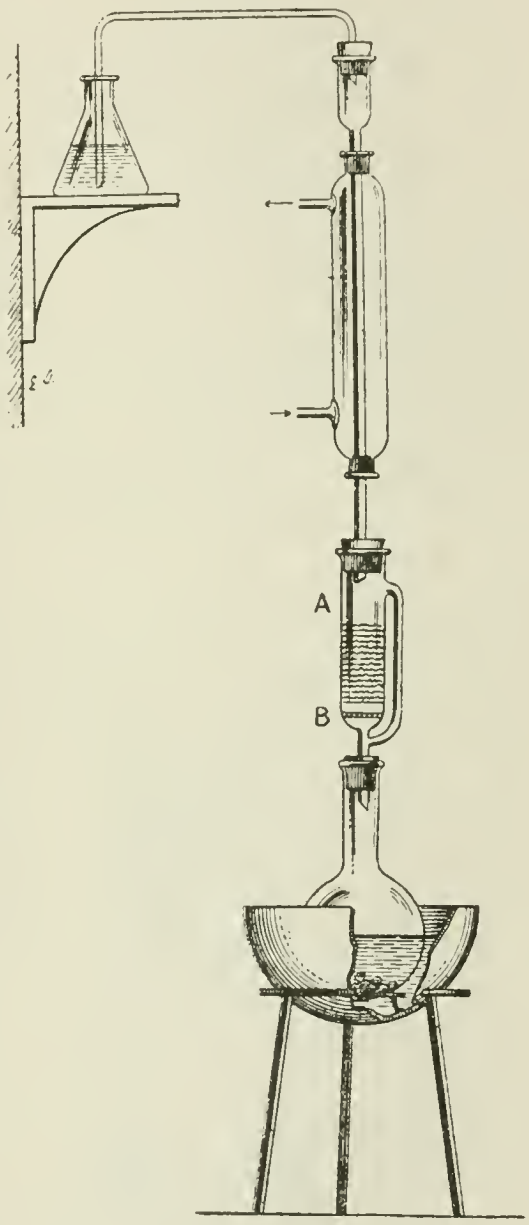
Autobiographies.—Under this title William Bodemann writes a plea for the establishment of a veteran association by the American Pharmaceutical Association. A man who has made his mark in pharmacy should furnish such an association his autobiography. The perusal of 100 such biographies by our young men would go a long way toward making them better pharmacists.—J. Am. Pharm. Assoc., 5 (1916), 693. (L. S.)

An Experience Meeting.—Citing the enthusiasm created at a meeting of New Orleans pharmacists where each got up and cited his early drug-store experiences, Philip Asher points out that lectures are made vital by judicious use of personal anecdotes. He further expressed the belief that association meetings would be better attended if extemporaneous recitals of personal experiences were given instead of more formal papers.—J. Am. Pharm. Assoc., 5 (1916), 1107.

B—APPARATUS AND MANIPULATIONS

Alkyl Iodides.—*Apparatus for Manufacture of.*—N. Nagai describes a simple apparatus for the manufacture of alkyl iodides. As shown in the illustration, the apparatus consists of a round-bottom flask, a modified Soxhlet extractor, a Liebig condenser and an Erlenmeyer flask containing water, communicating with the condenser by means of a bent tube. In the flask, yellow phosphorus and alcohol are placed; the iodine is placed in the Soxhlet upon a pledget of asbestos wool and is moistened with about one-tenth its weight of alcohol. After the apparatus is made air-tight the flask is placed on a water-bath and heated, when the alcohol vapors, condensing, return through Soxhlet, dissolving out the iodine little by little. By use of the apparatus, the author states he obtains 90 to 100 per cent. of the theoretical yield.—Jour. Pharm. Soc. Japan; through J. pharm. chim., 14 (1916), 213.

Fig. 1.

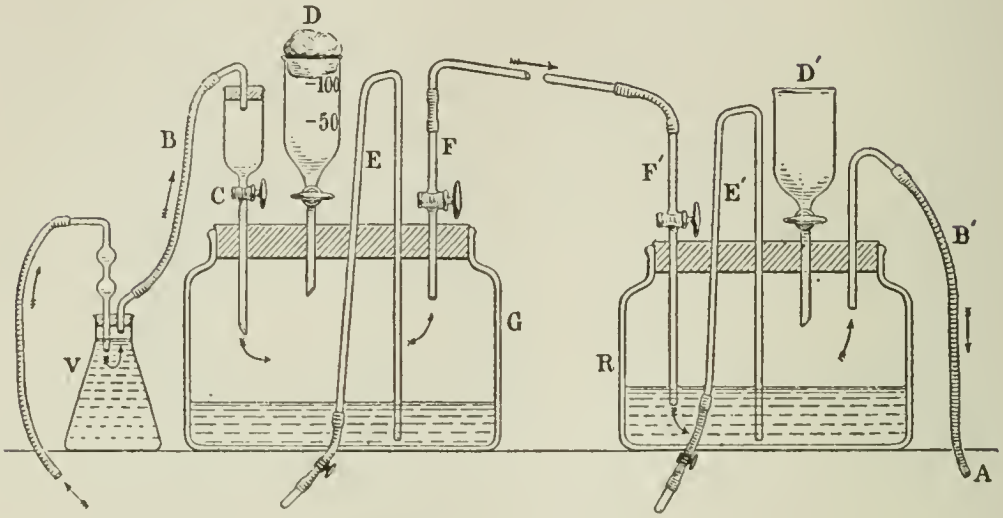


Apparatus for iodides.

Balances and Weights.—*Inaccuracy of Many Found in Drug Stores.*—In the Bulletin of the Indiana Board of Health, Inspector Cohn states that out of 871 drug-store balances inspected by him, 441 were in good working order. Ten per cent. (90 all told) were condemned outright. Out of 10,921 weights tested only 659 were found accurate; 6,335 were too light and 1990 were too heavy. He condemned outright 1,828 of the weights examined. The article

contains a number of suggestions as to the proper care of weights and balances.—Pharm. Era, 49 (1916), 222.

Fig. 2.



Apparatus for Bromine.

Fig. 3.

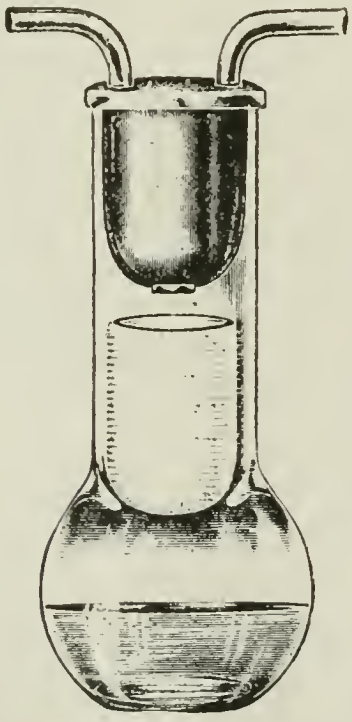
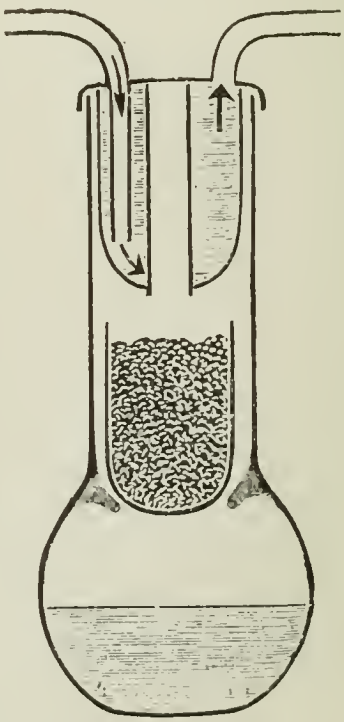


Fig. 4.



Extraction Apparatus.

Bromine.—*Apparatus for Its Recovery from Hypobromite Solution.*—In the estimation of urea an excess of hypobromite solution must be used and where any considerable number of such determinations are carried out a considerable amount of hypobromite is wasted. C. H. Collings describes a simple apparatus for the recovery of bromine from used hypobromite solution.

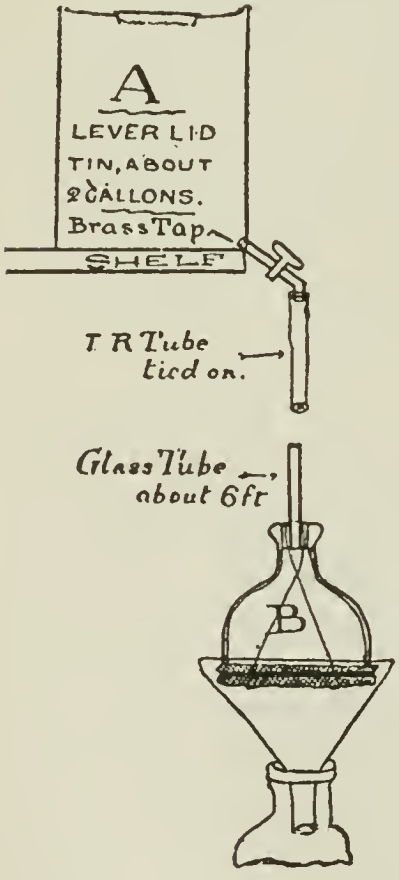
The process consists essentially of liberating the bromine by means of hydrochloric acid and transferring the vapors by means of an air current into a solution of sodium hydroxide to form new hypobromite solution.—Chem. News, 114 (1916), 259. (J. A. K.)

Extraction Apparatus.—*A New and Simple Form.*—A. A. Besson describes a simple form of extraction apparatus useful in food investigations. No cork connections are used. It may be weighed on an analytical balance. The illustrations (Figs. 3 and 4) show the construction. The cooler is a somewhat modified Storch condenser with simultaneous inner cooling. Even with the most vigorous boiling the amount of ether lost, if at all, is slight.—Chem. Ztg.; through Pharm. Ztg., 61 (1916), 116. (J. H. W.)

Filtration.—*Loss in Strength of Solutions Due to Filtering Medium Employed.*—It has long been know that in the filtration of solutions of solids there is always a slight absorption of the solid substance. This loss is usually so small that in filtering ordinary pharmaceutical quantities it is usually disregarded. When a clarifying agent is used in connection with the filtering process this loss is considerably increased. Wilbur L. Scoville has made a series of experiments in order to determine the amount of loss. Two hundred and fifty mils of liquid were used in each instance and the solutions passed through white filter paper, five inches in diameter. Two Gm. of paper pulp, or five Gm. of either purified talc, infusorial earth or fullers' earth were employed in the case of each solution with which the experiment was conducted. Three types of solutions were employed, namely, a neutral aqueous solution, an acidulated aqueous solution, usually containing one per cent. of citric acid, and a neutral solution in dilute alcohol. The constituents of the solutions were: quinine hydrochloride 2 per cent., strychnine sulphate 1.28 per cent., caffeine, morphine sulphate 1.5 per cent., atropine sulphate 0.7 per cent., and acetanilide. The experimenter arrived at the following conclusions: Excessive amounts of any filtering medium mean a loss in strength of the

solution and this loss is greater the nearer the solution is to its saturation point. Weak solutions show little and sometimes no loss, while strong solutions show a considerable loss. Fullers' earth is decidedly absorptive to alkaloidal solutions, but less so to neutral bodies. The strychnine and atropine were entirely removed by this agent while the other alkaloidal solutions lost from one-fourth to nearly one-half their strength. Another factor observed was that infusorial earth often contains carbonates which considerably increases absorption of alkaloids. For general purposes talc is recommended as the best filtering medium as it shows less loss than the use of the other materials employed, but even in the use of this substance care should be taken not to use it in excess both for economic reasons and for standard results. It is suggested also that in making preparations which need clarification it is safer to adjust the final volume before filtration rather than adding menstruum through the filter for that purpose, as the loss of a small portion of the product is better than the weakening of the whole.—J. Am. Pharm. Assoc., 5 (1916), 506. (L. S.)

Fig. 5.



Pressure Filter.

Filtration.—*Pressure Filter for Thick Liquids.*—M. Firth suggests the simple appliance shown in the illustration.

The filter B is made by cutting off the top of a quart bottle with a wheel glass-cutter. This is easily accomplished by standing the bottle against a block of wood of the correct height, and while holding the cutter on the top of the block, turning the bottle against it, so as to make a scratch quite round. Then turn the bottle round and round against the sealing jet, and the top will crack off with a clean edge. Now tie a piece of gamgee tissue very tightly over the open end of the cut-off top, fit a glass tube about 6 feet long, with a very tight cork, and the filter is ready. It is safer to tie a string once or twice around the neck and under the gamgee, as indicated in the sketch, to prevent the filtering pad

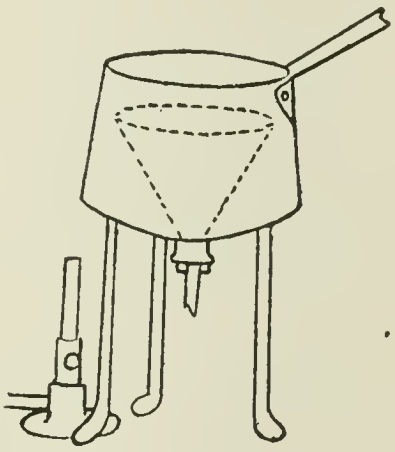
slipping off with the pressure. To make the filter closer, tear up a gray filter paper, pulp it by shaking with hot water in a bottle and pour into the filter while it is standing on a flat surface; allow the water to drain away, and remove the rest of the water by blowing through the bottle neck.

The tin container is drawn out of scale for convenience.

The tap is an ordinary gas fitting, which any plumber will fit. Two gallons is a convenient size. The rubber tubing need not be more than a few inches long, and the joints to the tap and glass tube must be securely tied. This being a pressure filter, the speed, of course, depends on the length of the tube—6 feet is usually sufficient, the container being on a shelf and the receiver on the floor.—Pharm. J.; through Drug. Circ., 60 (1916), 418.

Filtration.—*Hot Water Funnel.*—As shown in the illustration a serviceable hot water funnel can be made by soldering the neck of a tin can to a hole made in the bottom of a tin pot, fitting a perforated cork into this and passing the neck of a glass funnel through the hole. A. W. Nunn finds this device a highly satisfactory appliance for hot filtration, the water being kept warm by a Bunsen burner placed at the edge of the pot.—Pharm. J.; through Drug. Circ., 60 (1916), 209.

Fig. 6.



Hot Water Funnel.

Filtration.—*Use of Paper Pulp in.*—Jadidi advocates the use of paper pulp as a filtering medium in analytical work in preference to paper used in the ordinary way. It is a matter of common knowledge, he writes, that paper filters, far from being a quick filtering medium, yield not infrequently turbid filtrates or even break during filtration, which necessitates repeated refiltrations. On the other hand, the pulp filter, which never breaks and permits of uniform and comparatively rapid work, gives, as a rule, clear filtrates. It retains fine precipitates, such as ammonium phosphomolybdate, calcium oxalate, etc., more readily than a paper filter or a new asbestos filter. It is more accessible, easier to handle, and requires less time and skill for its preparation than the asbestos filter. The work with the pulp filter is more convenient and more

rapid than with the paper filter. The use of the pulp filter enables one to make considerable saving of filter paper, a point worth consideration in view of the scarcity of good filter paper in this country. It is a matter of course that it can be applied wherever crystallized or more or less crystalline precipitates have to be separated from neutral or moderately acid and alkaline liquids. The paper pulp filter, however, should not be used for the filtration of strongly acid or alkaline liquids (which holds also true for the ordinary paper filter), in which case filters of asbestos or glass wool are preferable; nor should the pulp filter be used for the separation of colloidal substances.—J. Franklin Inst.; through Drug. Circ., 60 (1916), 547.

Gloves for X-Ray Work.—Dr. Guinochet points out the well-known drawback to persistent X-ray work; the ultimate action of the rays upon the cuticle of the hands of the operating surgeon. To obviate this, he coats rubber gloves with a layer of lead carbonate, through which the X-rays do not penetrate. He uses as the white lead paint, a mixture of 100 grammes of finely powdered lead carbonate, 50 grammes of a saturated solution of rubber in petroleum benzine and 50 grammes of mineral oil. About 40 to 45 grammes of the coating to the glove has proven a sufficient protection.—J. pharm. chim., 13 (1916), 16.

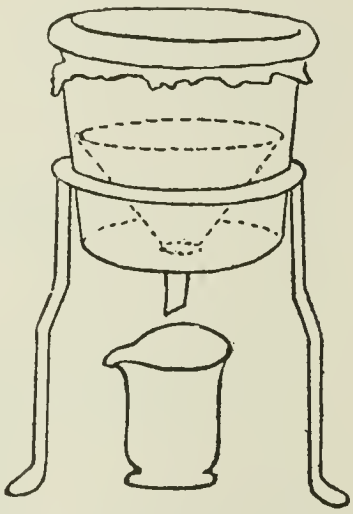
Melting Points.—*Simple Determination of.*—Knapp suggests that the substance be placed directly on the bulb of the thermometer. The latter is inserted in a corked test-tube, to serve as an air-bath, and the tube is immersed in a beaker of suitable liquid, as water, glycerin, etc. Before using it is advisable to boil and cool the liquid, to prevent the formation of bubbles of air on the sides of the beaker, which make observation difficult. For waxes, fats, or fatty acids, very fine scrapings are taken from the sample with the point of a knife, and are transferred with as little inquiry as possible to the bulb of the thermometer. They should cover less than one-half of the bulb. Under these conditions it is easy to see the progress of the fusion. Crystalline organic substances should be powdered, and the bulb of the thermometer pushed into the powder. The adhering film is all that is needed.—J. Soc. Chem. Ind.; through Pharm. Era, 49 (1916), 113.

Pill Counter.—*Simple Form.*—Jung describes a simple form of pill counter, which can be made in a few minutes by anyone. It

consists of three strips of wood, about one-half inch in thickness, attached to a small piece of plank, so as to form an equilateral triangle. One corner of the triangle is left open, forming a space of about three-quarters of an inch in width. A cleat attached to the bottom of the board gives it a slope, which should be in such a direction as to bring the open corner at the raised end of the board, and to the left, while a vertex of the triangle is at the lower end. The pills are placed on the board, and immediately roll to the lower end, where one pill fills the vertex, two pills form the second row, three pills the third row, and so on. By counting the rows and referring to a small table inscribed on the board, the number of pills is seen at once. For instance, 5 rows contain 15 pills; 50 pills are equal to 9 rows and 5 pills extra, etc.—Pharm. Ztg.; through Pharm. Era, 49 (1916), 24.

Precipitates.—*Apparatus for Washing Bulky.*—A. W. Nunn finds the device shown in the illustration very useful in washing bulky precipitates. It consists of a thoroughly clean flower pot, 7 inches high and 8 inches across the top. Through the hole in the bottom, the neck of a one-pint glass funnel is passed and across the top of the pot is tied the straining cloth in such manner, that the "sag" of the strainer causes the drops of water to fall into the funnel.—Pharm. J.; through Drug. Circ., 60 (1916), 209.

Fig. 7.



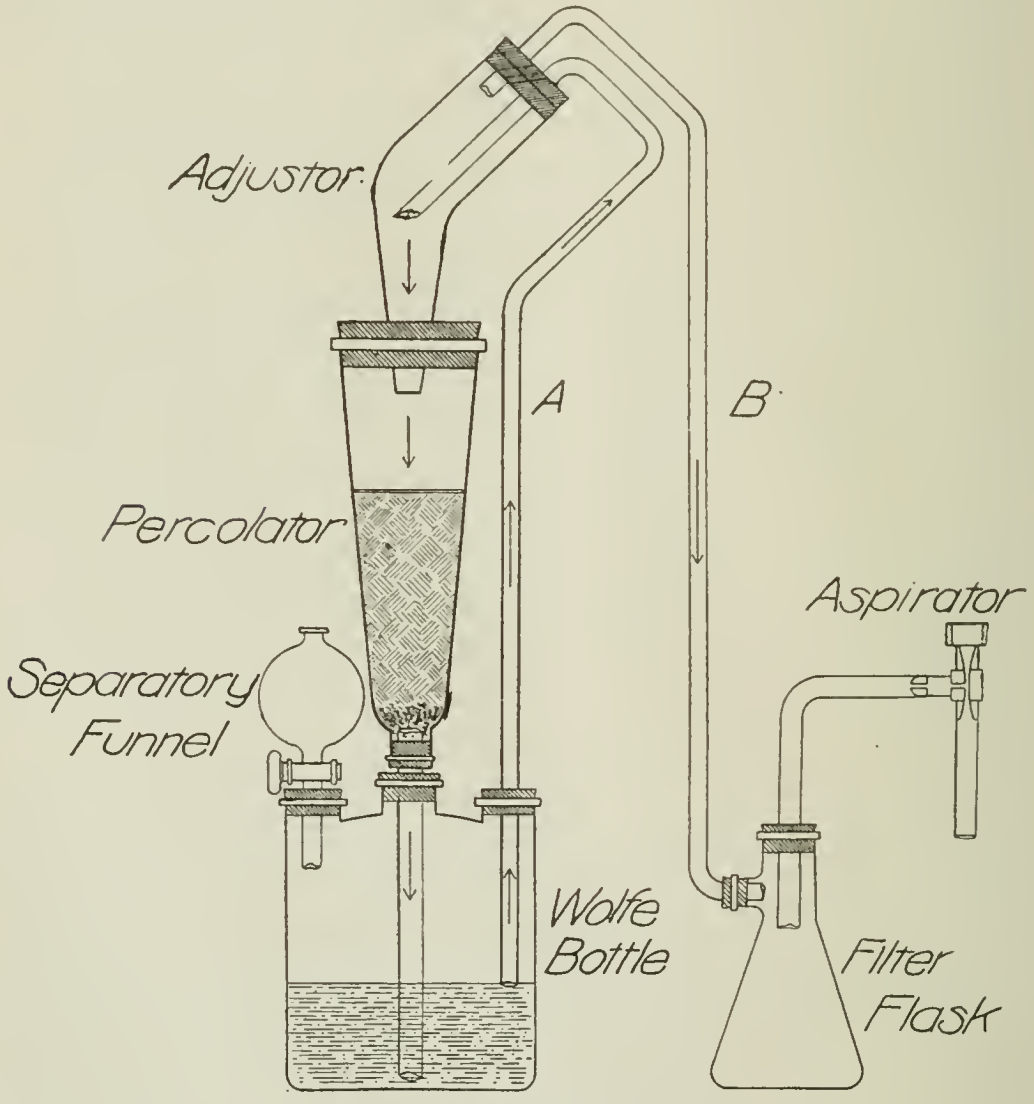
Washing Precipitates.

Vaginal Ovules.—*Making Molds for.*—These may readily be made from plaster of Paris. H. B. Cayaux greases a carton of 4 Cm. cross-section with petrolatum and fills it half full with a thin plaster paste (20 parts of plaster and 10 to 15 parts of water). An acorn or other model of desired form and size (hazelnut, chocolate egg) is well coated with petrolatum and is dipped in half-way as soon as the paste has become of the proper consistence. A few small depressions are made in the rim by means of a glass rod. When the plaster has completely solidified the surface and the acorn are painted with petrolatum and the plaster box completely filled with fresh plaster paste. It is well to previously bore a medium-sized greased nail into the acorn, the opening left by it

in the plaster serving to pour in the filling mass for the ovule. As soon as the plaster has hardened the upper part of the mold is separated from the lower and the acorn removed. The mold is then ready for use.—Pharm. Weekblad; through Apoth. Ztg., 31 (1916), 34. (J. H. W.)

Repercolating Apparatus.—J. W. Forbing describes a simple type of exhaustion apparatus. As the illustration shows it is constructed of a Woulfe bottle, a separatory funnel, a percolator,

Fig. 8.

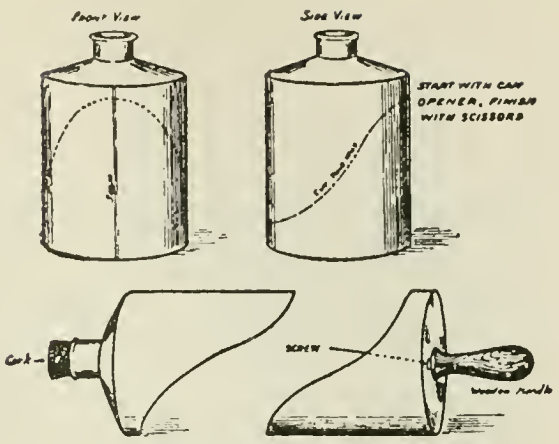


Repercolating Apparatus.

bent adapter, a filter flask, an aspirator and glass tubing. It will be noted that in the system, the percolate can by suction be lifted back into the percolator.—J. Am. Pharm. Assoc., 5 (1916), 1258.

Home-Made Scoops.—F. R. Braune suggests the utilization of empty collodion or ether cans by making them into scoops as shown in the appended illustration.—New Idea; through Merck's Report, 25 (1916), 189.

Fig. 9.

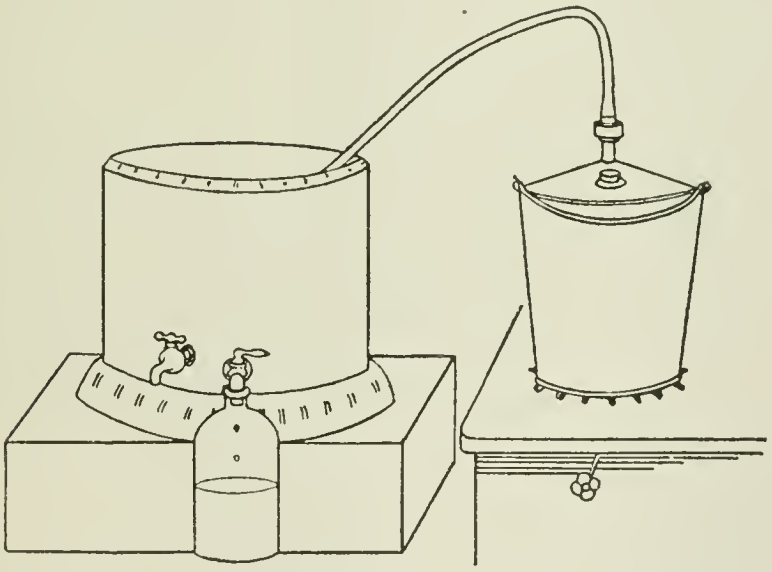


Home-Made Scoop.

Water Still.—*Cheap and Easily Made.*—C. E. Pierce describes a home-made still devised by him which may be made at a total cost of $2.50.

The still can be used with either gas or oil. The one described was run with gasoline costing 35 cents per gallon. Pharmacopœial

Fig. 10.

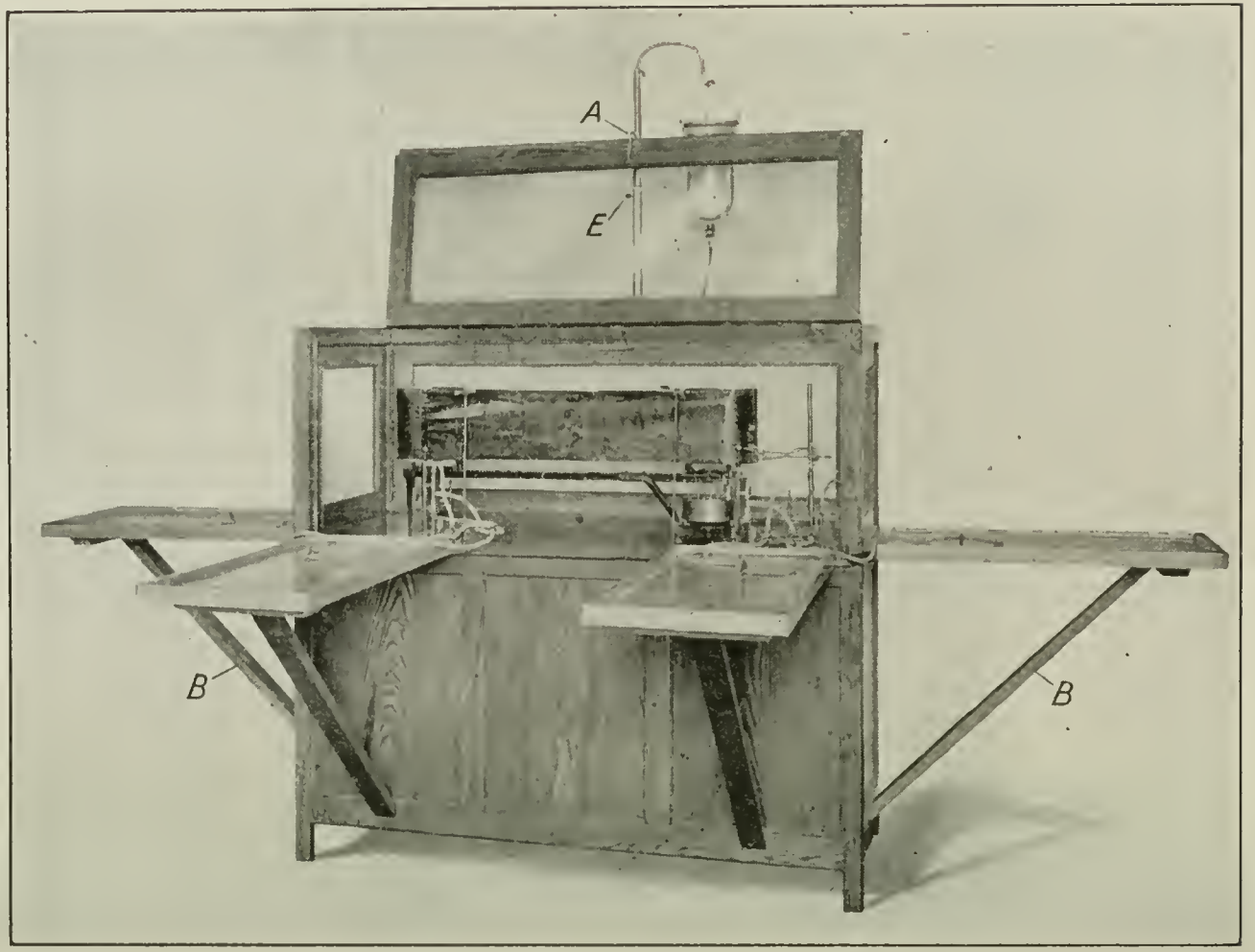


Home-Made Still.

distilled water was turned out at the rate of three gallons per day at a cost of 20 cents per gallon.—Drug. Circ., 60 (1916), 266. (H. H. S.)

Surgical Instruments.—*Use in Field of Electric Vibrator.*—When working in the field of the electric vibrator, ordinary instruments are violently oscillated. J. Bergonie and C. E. Guillaume

Fig. 11.



Operating Table.

say that iron-nickel alloy instruments containing 22 to 30 per cent. of nickel are unaffected.—Chem. and Drug., 88 (1916), 903. (K. S. B.)

Multiple Operating Table.—*Use for Blood Pressure Experiments.*—P. S. Pittenger describes a table devised by him upon which four animals may be fastened in drug assay work while their blood pressure is being traced on kymograph devised by him in 1913. The illustration shows the apparatus and it will be noted that the kymograph is kept in a glass case to protect it from dust. —J. Am. Pharm. Assoc., 5 (1916), 1178.

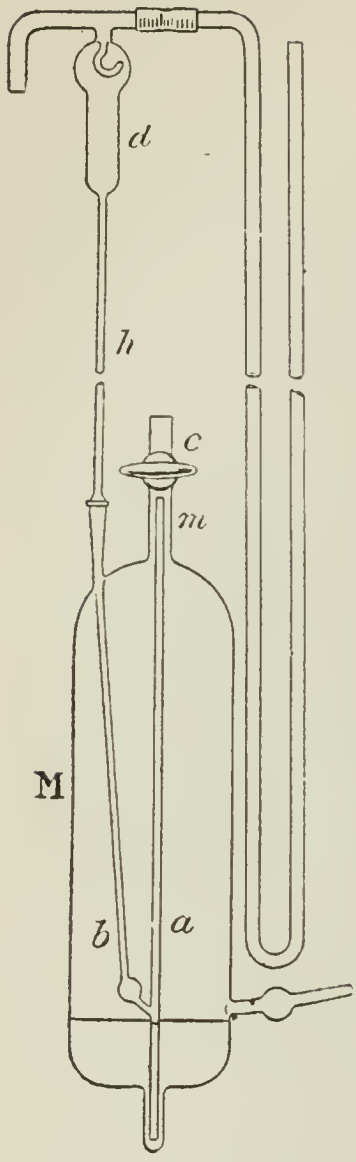
Thermometers.—*Bacteria on Clinical.*—Total cultures taken by W. R. Ramsey and H. M. Schoberg were eighty-two. Of this number, thirty-three were sterile; forty-nine contained organisms of various kinds. Streptococci occurred in thirteen cultures. The authors emphasize that careless washing will not suffice but that thorough washing with running water and then alcohol will render them clean. A thermometer case containing some solution such as alcohol or formaldehyde solution, in which the thermometer could be carried, lessens greatly the possibilities of infection. —Wisconsin Medical Journal; through J. Am. Med. Assoc., 67 (1916), 1116. (W. A. P.)

Safety Valve.—*New and Efficient.*—M. S. Losanitch describes an ingenious safety valve for preventing the back-flow of water of water pumps. The accompanying drawing will make its operation clear.

It consists of a cylindrical vessel, *M*, provided with a nozzle connected by an India rubber tube to the pump, and a glass tap, *c*, to let in air when required. In its interior is enclosed a T-tube of small internal diameter (not exceeding 2.5 Mm.), its arm, *a*, reaching close to the tap *c;* the arm *b* is fused through the mantle as shown in the drawing, and connected by means of a joint with the tube *h*, so that the total length is about 80 Cm. The top of the tube *h* is widened and serves as a safety tube, *d*, and it is connected on one side to the vessel to be evacuated. It is advantageous to mount this apparatus on a wooden board and to fit a Bunsen manometer as indicated.

Before using this safety valve it is necessary to fill up the cylindrical vessel with mercury until its meniscus reaches in the interior of the T-tube the lower edge of the arm *b*. When the whole ap-

Fig. 12.



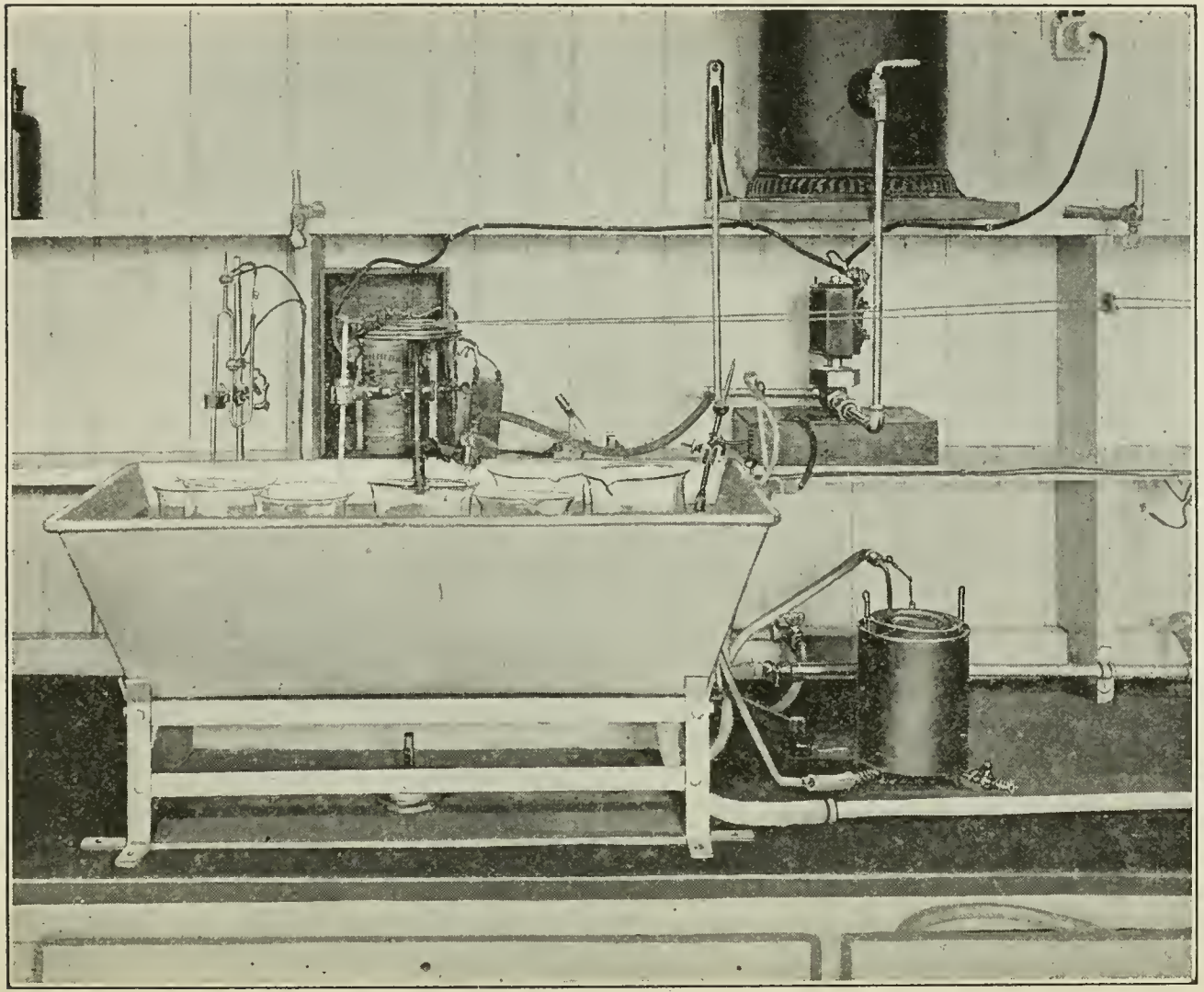
Safety Valve.

paratus is pumped out and a back-flow of water occurs, the water fills the reservoir *M*. In order to prevent too strong a rush of water it is advisable to insert in the tube leading to the pump, a glass tap whose stopper has a bore of 1 Mm. approximately. The increasing pressure of the water column above the mercury forces up its level in the T-tube, closes both its arms, and shuts off completely the evacuated vessel from the reservoir. If the cylindrical vessel has been charged with the proper amount of mercury this will happen when the water column has accumulated to a depth at most of 4 to 5 Cm. above the mercury. The inrushing water compresses the rarefied air contained in the reservoir almost to the atmospheric pressure, and if the dimensions of the apparatus are correctly chosen this will occur before the water reaches the top of the tube *a*.

As the pressure increases in the reservoir the column rises in the tube *h*, and when it has reached its maximum the tap *c* is carefully opened (the column will rise a little further) in order to allow the water contained in the reservoir to flow away through the water pump. After turning off the tap *c* the reservoir is again evacuated, the mercury column falls, and the communication between the pump and the vessel to be evacuated is again automatically established.—Chem. News, 113 (1916), 218. (J. A. K.)

Water-Bath.—*For Constant Temperature.*—P. S. Pittenger has devised a water-bath that will maintain constant temperature either above or below that of the room. As shown in the illustration it consists of a metal tank, provided with a storing apparatus, operated by a water motor. At one end of the tank there is a toluol-mercury thermostat so adjusted that when the temperature of the water rises above that desired, electrical connections will open a solenoid water valve, which will release

Fig. 13.



Water-Bath.

ice water from the cooler. So used, a temperature below that of the room may be maintained.

If it is desired to maintain a temperature slightly above that of the room, the alcohol-mercury gas regulator at the other end of the tank may be used. The article gives minute directions concerning the rigging up of the electrical connections.—J. Am. Pharm. Assoc., 5 (1916), 1260.

STERILIZATION.

Bacteriological Technique.—A. R. Smith describes at length methods of sterilization, preparation of culture media and of staining solutions. The paper also embraces some branches of applied bacteriology which might be undertaken by the pharmacist.

Mention is made of the use of dry and moist heat in sterilization with accompanying illustrations of the most common sterilizers.

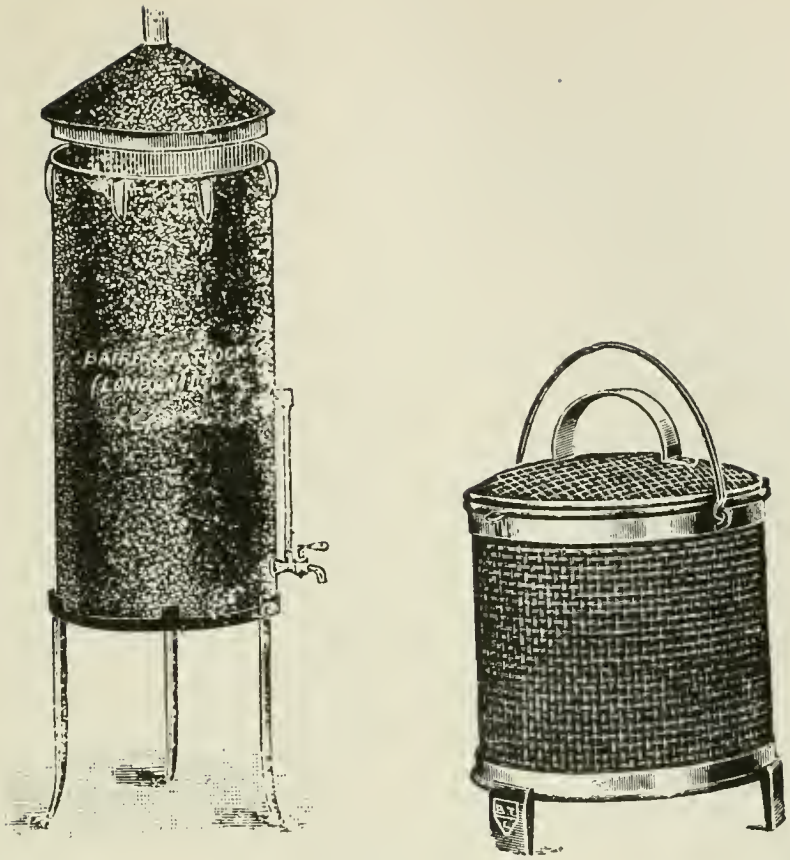
Various culture media and standardization of broth are described in detail. The successive steps are given in the technique of planting, transplanting and plating of bacterial cultures and subsequent incubation with illustrations of different types of incubators.

Most interesting are the methods described for the cultivation and separation of aerobic and anaerobic bacteria.—Pharm. J., 96 (1916), 97, 189, 421, 639 and 97 (1916), 234, 294. (F. H.)

Cocaine Solutions.—*Not Injured by Boiling.*—Virden is fully convinced that frequent or even prolonged boiling of solutions of cocaine hydrochloride does not injure or destroy their anesthetic value, as he has never failed to secure anesthetic action from such boiled solutions.—Am. Jour. Surg.; through Drug. Circ., 60 (1916), 212.

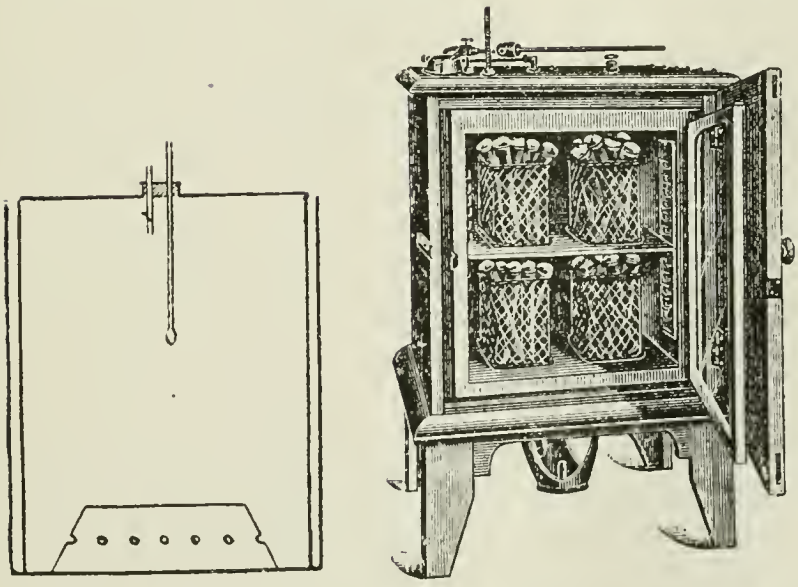
Dental Instruments.—*Sterilization.*—Experiments with various methods which have been recommended for sterilization of dental instruments have led H. E. Hasseltine to conclude that moist heat is the most effective agent for the sterilization of all metal instruments. For the destruction of non-spore-bearing bacteria, moist heat at 80° C. is nearly as efficient as boiling, and for practical purposes may be used instead of boiling. Instruments constructed of metal and whose complicated mechanism has sometimes caused them to be regarded as non-sterilizable may be sterilized by moist heat, provided the water be removed by immersing the instrument

Fig. 14.



Sterilizer.

Fig. 15.



Incubator.

in alcohol subsequent to sterilization. Instruments whose construction does not permit of their being boiled may be disinfected by chemicals. A list of sanitary recommendations, including the methods most applicable to the sterilization of certain instruments, is appended.—Bulletin No. 101, Hygienic Laboratory; through Chem. and Drug., 88 (1916), 52. (K. S. B.)

CONTAINERS.

Glass Ampuls.—*Alkalinity of.*—The alkalinity of the glass frequently has a detrimental effect on the contents of ampuls. Krebère, while applying various reagents for estimating the alkalinity of the glass, found that the sensitiveness of the reagents decreases in the following order: narcotine salts, strychnine salts, phenolphthalein, corrosive sublimate and morphine salts. Narcotine salts act even in the cold, for, when the ampul is filled with a 0.1 per cent. solution of such a salt, a turbidity due to the liberation of the free base is noticed within 10 to 15 minutes, when the glass is alkaline.—L'Union Pharm.; through Drug. Circ., 60 (1916), 747.

Ampuls of Iodine.—*As First Aid Dressing.*—A. Vicario suggests an ampul containing iodine for field use prepared as follows: Dissolve in a flask plunged in a freezing mixture of ice and salt, iodine 10, ether 40, by weight; ethyl chloride to make 200, by volume. This solution is filled into thick glass ampuls of 2 mils capacity, drawn out to a capillary tube at one end. The aperture is then sealed in the blow-pipe, and a file mark made in the drawn-out beak just below the seal. For use, the tip of the tube is broken off at the file mark, when the iodine solution issues as a fine spray, which can be applied to a wound in any position. The advantage of the application of the spray over the usual solution is obvious. In addition to this, the analgesic effect of the solvent mixture is of great service in allaying pain from the lesion.—J. pharm. chim.; through Pharm. J., 96 (1916), 193.

Medicinals in Ampuls.—T. Paul discusses the changes suffered by liquid medicaments in glass, together with the causes and phenomena productive thereof and incidental thereto. In order to obviate such disadvantages, the use of "dry and liquid ampuls" is recommended and illustrated, the idea being to mix medicament and water contained in separate ampuls, just prior to application.

—Südd. Apoth. Ztg., 56 (1916), 459; through Chem. Abstracts, 1917.

Laboratory Glass.—*Quality of French.*—P. Nicolardot states that recent examination of French laboratory glass apparatus from three sources shows that, as regards solubility in water, and in solutions of ammonia, ammonium chloride, sodium carbonate, and dilute hydrochloric acid, these compare favorably on the whole with such well-known German or Austrian brands as Jena, Krasna, Kavalier, and Thuringian glassware. The determinations were made under identical conditions by boiling with the solvent for three hours. The French glass was equal and sometimes superior to the German product when tested with water in an autoclave under pressure at 120 to 160° C. The only point in which Jena and Krasna glass was distinctly superior to the French apparatus was in resistance to sudden change of temperature. Under the conditions of the experiment the breaking point of French glass ranged from 125 to 175°, whereas that of German and Austrian glass was from 175 to 225° C.—Comptes rend.; through Pharm. J., 97 (1916), 569.

Glass.—*Zinc Content of.*—Javillier states that he suceeded in extracting 0.0025 Gm. of zinc, with acidulated water, from an Erlenmeyer flask having a capacity of 500 mils, and made of Jena glass. A flask of Bohemian glass yielded negative results. The author tried to establish the influence which the presence of zinc might possess in the case of micro-organisms. He conducted the investigations with the Aspergillus niger, which is particularly reactive to zinc. The development of this micro-organism in the Jena flask was quite abnormal, while in Bohemian or quartz flasks its development made only the usual progress. The author calls attention to the fact that the presence of such small quantities of zinc under ordinary circumstances can be ignored. Conditions might, however, arise in which it would have to be taken into account.—C. U. C. P. Al. J., 23 (1916), 34. (G. C. D.)

Glass Bottles.—*Test for Non-Actinic.*—H. Bordier suggests that the use of a very dilute pseudo-solution of iodine is prepared by adding 10 drops of tincture of iodine to a liter of water, shaking after the addition of each drop. A brownish yellow liquid is thus obtained. If a little freshly prepared starch mucilage is mixed with a liter of water, and three drops of tincture of iodine are added,

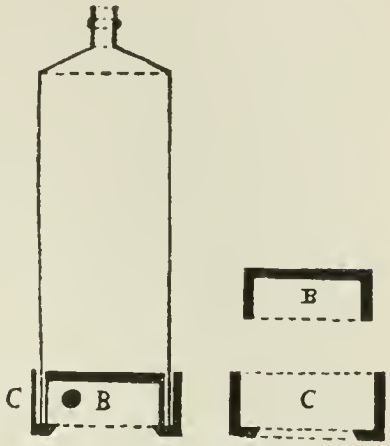
a bright blue liquid results. Neither of these liquids is a true solution, since in both the iodine in them is in a colloidal condition, suspended in the water in the form of ultra-microscopic particles. Both these liquids are very sensitive to the action of actinic rays of light. When exposed to daylight in white glass bottles, they lose their color in a few hours. In the case of the blue liquid, the color is restored on again adding a trace of iodine. If starch mucilage is added to the decolorized—originally yellow—iodine solution, no blue color, indicating free iodine, will be obtained. Controls of the same solutions kept in the dark will be found to retain their original blue and yellow tints unimpaired. These two liquids, therefore, afford useful reagents for testing the quality of commercial "non-actinic" glass bottles used for storing unstable galenicals and chemicals. A yellow glass, which is most widely used for this purpose, has been found to be quite ineffective in preventing the decoloration of these two iodine reagents, and is, therefore, useless for the purpose for which it has acquired an unmerited reputation.—Comptes rend.; through Pharm. J., 97 (1916), 251.

Glass Bottles.—*Danger of Shot as Cleaner.*—P. Carles states that in France, as in England, the war has brought about a scarcity of glass bottles of all kinds. In consequence, there is a very great demand for clean returned empties. In that country, shot has been widely used, for at least two centuries, as a means of removing adhering dirt from the inside of bottles during the process of rinsing. Although undoubtedly efficacious, this method should not be used for any bottles which are to contain beverages or medicines. Quite often, distinct and visible particles of lead may be found adhering to the sides of the otherwise clean bottle after shot has been well shaken with water therein. Invariably, if such bottles are washed out with dilute hydrochloric acid, the washings will give very marked reactions for lead. Shot should be prohibited from use in all wine bottles or those which are to contain aerated waters.—Rep. de Pharm.; through Pharm. J., 97 (1916), 251.

Glass Stoppers.—*Non-Stickable.*—In bottles containing alkaline solution which are likely to cause the glass stopper to stick to the neck, A. W. Nunn uses loosely fitting globe stoppers, which close the orifice just enough to keep out air and dust.—Drug. Circ., 60 (1916), 209.

Glass Tubes.—*Substitution for Tin Tubes.*—Glass tubes are now being employed in Germany to replace collapsible tin tubes. The tubes are filled in the same way as the tin tubes, after the movable bottom *B* and the safety bottom *C* have been removed. After filling both are replaced. The object of *C* is to prevent *B* being pressed out by expansion of the contents and to prevent the finger being cut on the sharp glass edges when pressure is applied to *B* to force the contents out at the top.—Chem. and Drug., 88 (1916), 964. (K. S. B.)

Fig. 16.



Glass Tubes.

MISCELLANEOUS.

Blue Glass.—*Use as Protective against Flies.*—As the visible part of the spectrum for flies lies between the green and orange, C. Galaine and C. Houlbert suggest that hospitals be protected from flies by using blue glass in the windows.—Chem. and Drug., 88 (1916), 903. (K. S. B.)

Catgut.—*Preparation.*—A simple and inexpensive method of preparing surgical catgut is proposed by Roeder. The gut is placed in a saturated solution of picric acid in olive oil for 1 week, rinsed for 10 seconds in sterile water or a 1–5000 bichloride solution to remove oil globules, and stored in 95 per cent. alcohol. In 4 days it is ready for use. Sinclair prefers to formalize it in a 5 per cent. solution for 24 hours to give it additional strength and to prevent swelling. This method gives a strong, pliable gut which is sterile throughout, slowly absorbed and does not deteriorate with age.—Lancet; through Chem. and Drug., 88 (1916), 477. (K. S. B.)

"Cheep Gas" Tablets.—Vanderkleed and E'we have analyzed tablets of the above name, sold for enriching gasoline fuel under the slogan "More mileage—no carbon." They find them to consist of naphthalene scented with oil of citronella.—J. Am. Pharm. Assoc., 5 (1916), 716.

Cosmetics as Drugs.—M. I. Wilbert points out the danger arising from the use of cosmetics and states among other conclusions:

"Cosmetics, as ordinarily used, tend to clog the pores or irritate the skin and are thus likely to interfere with the normal healthy action of that organ.

"To prevent serious intoxications and to preclude obvious deception, cosmetics should be classed as drugs and proprietary preparations sold as cosmetics should be required to state on the label the name of any poisonous ingredient that may be contained therein."—Bulletin, U. S. Public Health Service; through Pract. Drug., June, 1916, 13.

Dyeing Horses' Coats.—According to Bauchet, the following method is stated to convert the coat of a light-colored horse into a permanent deep chestnut-brown: The coat is dressed first with a 1 : 20 solution of lead acetate; then with a solution of the same strength of sulphurated potash. The lead sulphide being fixed in the substance of the hair, the dye is claimed to be permanent. As white horses are very conspicuous, this simple and economical method of converting them into chestnut horses should be of service for military purposes.—L'Union Pharm.; through Pharm. J., 96 (1916), 105.

Etching on Metals.—*Liquid Preparations for.*—For soft steel: 1 part of nitric acid and 4 parts of water. For hard steel: 2 parts of nitric acid and 1 part of acetic acid. For deep etching of both: 10 parts of hydrochloric acid, 2 parts of potassium chlorate and 88 parts of water. For bronze: 100 parts of nitric acid and 5 parts of hydrochloric acid. For brass: 16 parts of nitric acid, diluted with 160 parts of water. 6 parts of potassium chlorate are then dissolved in 100 parts of water, and the solution added to the diluted acid. To protect the parts of metal which are not to be subjected to the etching process, the use of liquid asphalt is recommended.—Bayr. Ind. u. Gewerb. Bl.; through C. U. C. P. Al. J., 23 (1916), 144. (G. C. D.)

Eutectic Mixtures.—*Incompatibilities Due to.*—A. Regenbogen discusses the liquefaction occurring when certain solid compounds are triturated. Among those mentioned are (*a*) crystallized sodium sulphate and potassium bromide; (*b*) borax and crystallized alum (or zinc sulphate); (*c*) alum and crystallized lead acetate; (*d*)

urea and sugar; (*e*) sugar and potassium bromide. The physical chemistry of these changes are discussed in the paper.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 10 (1916), 2613.

Face Powders.—*Composition of Commercial.*—Dr. E. F. Ladd reports on analyses made at the laboratory of the North Dakota Food and Drug Commission on 13 samples of commercial face powder. Nine of them were labelled rice powder and none of these were true to name; in fact 3 contained no starch at all. A typical "rice powder" contained 48 per cent. of starch, 42 per cent. of talc and 10 per cent. of zinc oxide. Another consisted of 73 per cent. of talc and 25 per cent. of zinc oxide. In almost every instance, the talc used in the powder was the unpurified variety, containing iron and aluminum. Of the other four samples examined, one consisted of 13 per cent. of starch, 83 per cent. of talc and 4 per cent. of bismuth subnitrate; one contained 6 per cent. of starch, 68 per cent. of talc and 26 per cent. of zinc oxide; one was composed of 66 per cent. of talc and 31 per cent. of zinc oxide. while the fourth was a mixture of 36 per cent. of starch, 45 per cent. of talc and 19 per cent. of zinc oxide.—Drug. Circ., 60 (1916), 408.

Poisonous Gases.—*Use in Warfare.*—Of the poisonous gases which may be used in the war, J. Guareschi mentions chlorine, hydrochloric acid, chlorine dioxide (b. p. 10°), bromine, hydrobromic acid, nitrogen dioxide and tetroxide (b. p. 22°), nitrosyl chloride, carbon monoxide, carbon oxychloride (phosgene, b. p. 8°), carbon dioxide, hydrocyanic acid (b. p. 27°), cyanogen, cyanogen chloride (CNCl, b. p. 15°), ammonia, hydrogen sulphide, sulphur dioxide, phosphine and arsine. A tabulation in the original article shows the amounts of some of these in 1000 parts air which may cause death. Water-free liquid chlorine and hydrochloric acid do not attack steel; they may, therefore, be transported in steel cylinders.

In addition to the above-named substances there are others which act as irritants; for instance, benzyl chloride which though boiling at 176° gives off vapors very irritating to the eyes; similarly benzyl bromide boiling at 210°.

The poisonous action of most of the gases may be avoided or minimized by protective masks. The most efficient protectives are alkali hydroxides and carbonates in solid form; for chlorine and bromine, the alkali thiosulphates. The author believes that gauze sacks containing a layer of sodium carbonate in crystal form

placed before the breathing organs will enable respiration in an atmosphere containing up to 5 per cent. chlorine. The eyes especially must be protected; the eyelids are greased with vaseline.

Into the masks may also be placed pieces of soda-lime or pumice saturated with soda-lime. Frequently, also, solutions of sodium hydrosulphide and lime-water are employed as protectives; oxygen appliances and ampuls of atropine solution for subcutaneous injection are stored in the neighborhood of the trenches as antidotes. —Apoth. Ztg.; through Pharm. Weekblad, 53 (1916), 112. (H. E.)

Ink.—*Permanence of.*—According to R. H. Parker, the permanence of writing ink is determined not alone by formula but by the method and duration of storage. The greatest deterioration is due to exposure and disturbance in the ink-stand. In an ideal ink, the pigment is in solution permitting easy passage into the paper where it leaves an insoluble black deposit. Iron gallotannate is a good substitute for carbon which would be perfect. Mr. Parker draws some conclusions from experimental manuscripts made forty years earlier with an ink made with Aleppo galls and ferrous sulphate. The fresh ink was very pale but the writing soon turned black and has remained practically unchanged. The same ink stored in a cask for two years and subsequently exposed for three months wrote deep black at first but at the expiration of forty years was slightly brown. Some of this second sample exposed in an ink-well for six months longer deposited much sediment leaving the ink brownish black and the writing is very pale though still legible. The maximum boldness and permanence is secured by storage in a cool place with addition to the old stock every three or six months. Frequent refilling of the ink-well and avoidance of blotters add to the permanence.—Pharm. J., 97 (1916), 84. (Z. M. C.)

Ink.—*Permanence of.*—D. B. Dott, finding it impracticable to test a sample of ink by exposure of writing for a period of years (signatures often becoming illegible through the prolonged action of light and air), conceived the idea of making a limited application of hydrogen dioxide as the nearest chemical equivalent to the bleaching effect of the atmosphere. Writing done by different inks was exposed to light, the paper being occasionally moistened with a 3 per cent. solution of hydrogen dioxide, the result being that the handwriting gradually became invisible, in some cases

more quickly than in others. With ferric tannate, indigo, and aniline blue as the principal substances used in making writing ink, it was found that all of them are rapidly decolorized by warming with hydrogen dioxide solution. The violet ink used for typewriters is less readily acted on, but was quickly bleached by sulphurous acid. Carbon-containing inks are able to resist the action of both hydrogen dioxide and sulphurous acid. When writing is of an important nature, and is desired to endure, some form of carbon ink appears to be the only trustworthy preparation.—J. Soc. Chem. Ind.; through Pharm. J., 97 (1916), 7.

Litmus Paper.—*Sensitivity of Commercial.*—Viehoever and Ewing report on the examination of litmus paper obtained from ten firms. They find that the blue paper is the most sensitive: the poorest sample turning red when treated with N/250 acid, while the best had its color changed by N/4000 acid. The poorest red paper was turned blue by N/100 alkali while the best turned when treated with N/1000 alkali. The neutral papers were only slightly sensitive; the limits ranging from N/50 to N/1000 on the acid side and N/100 to N/1000 on the alkali side. A satisfactory litmus paper should have close formation, form, medium hard texture (like S. & S. filter paper No. 589); should be 12 to 15 Mm. wide and should be from 0.1 to 0.12 Mm. thick. It should be kept in well-stoppered, amber-colored bottles.—J. Am. Pharm. Assoc., 5 (1916), 599.

Paste.—*A Prehistoric.*—I. and G. Cotte report on a prehistoric paste which they found in the eneolithic layers in a cave near Adavuste. The paste occurred as oily drops sticking to a piece of bone. It was colored yellow on the surface and black where it had come in contact with the bone. A chemical analysis of the paste revealed the presence of finely powdered roasted barley, meat, and mineral kermes. In addition to this bone and paste a small spatula made of bone was found with which the author thought the paste probably was applied.—L'Union Pharm.; through Drug. Circ., 60 (1916), 608.

Root Beer.—*Alcohol Content of Home-Brewed.*—C. H. LaWall has prepared root beer by the usual method of mixing an extract with sugar and water and then fermenting the mixture with yeast. He finds that such a mixture, after two days, contains 0.25 per cent. of alcohol and that after 11 days it contains 1.52 per cent. of alcohol. In this series of experiments, the alcohol content did not

rise above 1.52 per cent. even after 21 days' standing. In later experiments, where the mixture was allowed to stand 3 hours before bottling and where the bottles were only partially filled, he obtained a root beer containing 1.77 per cent. alcohol. From this it is apparent that three bottles of home-brewed beer that has stood ten days contains as much alcohol as one bottle of ordinary beer.—Am. J. Pharm., 88 (1916), 355.

Sponges.—*Cleansing of.*—For cleaning sponges which by prolonged use in connection with soap have become greasy, Reeb recommends the following process: The sponges are placed for twenty-four hours in 5 per cent. ammonia water, washed well with water, placed into 4 per cent. ammonia water for several hours and again washed with water. They are then dipped in a 0.05 per cent. potassium permanganate solution and then in a 0.2 per cent. sodium bisulphite solution, to which a few drops of sulphuric acid have been added. Finally the sponges are washed well with water and dried.—L'Union Pharm.; through Drug. Circ., 60 (1916), 707.

Spraying Solution.—*Martini's Lime-Copper.*—M. Ripper says that by using a mixture of copper sulphate and alum solution with freshly prepared milk of lime, an insecticide and fungicide horticultural spray may be prepared which is as effective as the ordinary bouillie bordelaise, although it contains less than half the amount of copper sulphate. It is stated, moreover, to be even more active, since the alum causes the spray to cling better to the leaves of the vegetation treated. Martini's formula is: copper sulphate, 400 Gm.; alum, 400 Gm.; freshly burned lime, 500 Gm.; water, 100 liters. The alum and copper sulphate are dissolved in part of the water. The lime is slaked, and suspended in another portion. This milk of lime is added to the solution of the sulphates, with constant stirring, until a distinct alkaline reaction is obtained with litmus or phenolphthalein paper. Sufficient water is then added to make the bulk of the liquid up to 100 gallons, and the spray is ready for use. This solution is just as effective as a mixture containing 1 per cent. of copper sulphate, and is much more economical.—Wiener Landw. Ztg.; through Pharm. J., 96 (1916), 223.

Surgical Dressings.—*Proper Specifications for.*—Lahache gives a summary of a series of investigations reported by Prouzergues and Buisson, who state that 1 gramme of absorbent cotton should absorb at least 18 grammes of water; that cotton

dried for 6 hours should not lose more than 5 per cent. of its original weight; that absorbent gauze should have 15 x 15 threads per square centimeter and should be free from sizing. Assays of various fixations (phenol, boric acid, etc.) are discussed.—L'Union Pharm.; through Chem. Abstracts, 10 (1916), 2783.

Tinfoil.—*Coloring and Affixing.*—Before applying the required color to the tinfoil this must first be freed from any adhering fat. This is easily accomplished by treating the sheet tinfoil with a mixture of prepared chalk and alcohol in the form of a smooth paste. Only the best kinds of prepared chalk should be employed, as otherwise the tinfoil will lose its luster. After such treatment washing and drying are resorted to, after which the selected color, properly prepared, is applied by means of a camel's-hair brush. The coloring liquid is prepared as follows: 100 parts of bleached shellac are dissolved in 500 parts of 96 per cent. alcohol in the cold. To this solution are added 50 parts of the best grade of elemi resin, and 12 parts of clear Venetian turpentine. The liquid is filtered and a sufficient quantity of an alcoholic solution of the desired coloring matter added. To affix tinfoil to containers or other surfaces, the following may be employed: 1. A paste made by treating 10 parts of rye flour with 4 parts of caustic soda, adding a sufficient quantity of distilled water, a small quantity of turpentine and the whole mixed thoroughly. 2. A paste made by mixing 50 to 60 parts of confectioners' sugar with 180 to 200 parts of solution of sodium silicate, avoiding heat. Only alcohol-soluble coloring materials are to be employed.—C. U. C. P. Al. J., 23 (1916), 186. (G. C. D.)

Toilet Powders.—*Manufacture of.*—E. W. Lucas gives the following recipes for face powders:

Non-Clinging Violet Powder.—(*a*) Starch powder, 890; powdered orris, 100; oil of neroli, 5; oil of bergamot, 3; oil of rose, 2. (*b*) Starch powder, 500; kaolin, 480; synthetic musk, 5; oil of bergamot, 12; oil of clove, 3.

Clinging Violet Powder.—(*a*) Kaolin, talc, zinc oxide, wheat starch, of each, equal parts. (*b*) Talc, 3; kaolin, 1; bismuth oxychloride 1. (*c*) Zinc stearate, prepared white diatomite, bismuth oxychloride, talc, of each, equal parts. (*d*) Soft white paraffin 1, elutriated diatomite, 10; talc, 9; the paraffin is to be dissolved in hot chloroform and sprayed upon the mixed powders.

By diatomite, a high-grade white kieselguhr is meant. For colors, Lucas suggests: *Flesh.*—Yellow ochre, 90; bole, 6; carmine

4. *Pink.*—Yellow ochre, 75; carmine, 25. *Cream or "Rachel."*—Yellow ochre, 94; bole, 4; burnt sienna, 2. Of any of these, 60 to 120 grains are required to the pound of white powder.

Cake Powders consist of toilet powders moistened with mucilage of tragacanth and pressed into molds. Some manufacturers add 2 per cent. of plaster of Paris.

Nursery Powders contain boric acid, zinc oxide and starch. Talc, kaolin or kieselguhr should not be used unless sterilized as these may contain a tetanizing bacillus common to the soil.

Antiseptic Foot Powder.—Boric acid, 75; zinc oxide, 5; sterilized talc, 20; oil of eucalyptus or oil of thyme as perfume.—Perf. Essent. Oil Rec.; through Drug. Circ., 60 (1916), 143.

C—PREPARATIONS

GENERAL.

Galenical Preparations.—*Sugar Assay of.*—A. Heiduschka and J. Schmid having found that some extracts and tinctures contain appreciable amounts of sugars or other reducing substances report on experiments which were undertaken in order to find out whether or not the percentage of these substances could be used for the valuation of some galenical preparations. The extracts were dissolved in water while the tinctures were diluted with four times their volume of water. These liquids were mixed with an excess of Fehling's solution, the mixture boiled for five minutes and the cuprous oxide collected in the usual way. Samples of the same preparation made by three different manufacturers were examined. It was found that with extracts, no concordant results could be obtained, probably because the extracts were prepared by different processes and at different temperatures of evaporation. Very good results were obtained with tinctures.

10 mils of	Gm. copper
Tincture of arnica gave	0.1311
Tincture of cinchona gave	0.1738
Tincture of rhatany gave	0.2769
Tincture of opium gave	0.1311
Tincture of gentian gave	0.3401
Tincture of nux vomica gave	0.0172
Tincture of aconite gave	0.1126
Tincture of veratrum gave	0.1031
Tincture of lobelia gave	0.0666

—Apoth. Ztg.; through Pharm. Weekblad, 53 (1916), 1334. (H. E.)

Belgian Pharmaceuticals.—The large number of Belgian refugees in England find it difficult to have their prescriptions compounded as they obtained them in Belgium of the days of peace. L. Maertens therefore publishes the recipes for the better-known Belgian pharmaceuticals, including aromatic vinegar, hemostatic water, tar water, sedative water, phenol water, fluidextracts for Vanier's and for Dessessartz' syrup, Van Swieten's solution; baume tranquille, Haen's pills, purgative lemonade, syrup of ether, syrup of anise, Vanier's syrup, iodotannic syrup, concentrated iodotannic syrup, Dessessartz' syrup, Burow's solution, pectoral species, laxative species, spirit of anise, tincture of iodine, compound tincture of jalap, camphor pomade, and Helmerich's ointment.—Chem. and Drug., 88 (1916), 860.

ACETA.

Acetum Sabadillæ.—*Preparation.*—Joltze calls attention to the difficulties experienced in filtering this preparation when made in the customary manner. He suggests that the plant part be macerated in diluted acetic acid for a period from 8 to 10 days, and not with the customary mixture of diluted acetic acid and alcohol. After filtration and expression 2 and 3 grammes of dried albumen for each 5 liters of liquid are added, and the liquid heated. The albumen acts as a clarifying agent, and after subsequent filtration, the alcohol is added.—Pharm. Ztg.; through C. U. C. P. Al. J., 23 (1916), 118. (G. C. D.)

AQUÆ.

Medicated Waters.—*Simple Preparation.*—Not entirely satisfied with the official method for manufacturing medicated waters, John K. Thum cast about to find a simple process and, at the meeting of the Pennsylvania Pharmaceutical Association, suggested a method which he outlined as follows, stating that it produced a saturated solution that was clear and sightly:

Eight mils of volatile oil are poured into a 4-liter bottle and distilled water added in portions, the bottle being vigorously shaken after the addition of each portion until enough distilled water has been added to bring the measure of the finished product up to 4 liters.

When the dispensing bottle requires replenishing, the stock container is well shaken and the medicated water filtered through a well-wetted filter paper.—Drug. Circ., 60 (1916), 707.

Aqua Chloroformi Mentholata.—The following recipe is suggested:

Menthol	0.05
Chloroform water	enough
Distilled water	50.00
Peppermint water	50.00

The menthol is dissolved in as much chloroform as is required to make 50 Gm. of chloroform water. The distilled water and peppermint water are then added, in portions, with vigorous shaking.—C. U. C. P. Al. J., 23 (1916), 12. (G. C. D.)

Orange-Flower Water.—*Cause of Green Color.*—R. Guyot has recently had experience with a consignment of orange-flower water in glass bottles, which, from its normal yellow tint, gradually developed a green color. This was more pronounced in those bottles which were exposed to light than in those stored in the dark. The green water soon developed flocculent green masses, which were identified by micro-examination as the fungus Hydrocrocis hydrolatorum, which is the most frequent cause of the flocculent deposit found in distilled waters. This organism, however, is colorless, and the green tint of the water and of the mycelia must necessarily have been due to some other cause. No algæ could be detected, and the color had none of the spectroscopic characters of chlorophyll. Nor was it due to any chemical contamination. It was found that by inoculating normal orange-flower water with a drop of the green water, the bulk soon developed a green tint. After sterilization, however, it lost this property. The cause of the color was thus indicated as being of bacterial origin. By the usual bacteriological methods a bacillus producing a fine green color was easily isolated and obtained in pure cultures. It differs from B. liquefaciens fluorescens and other chromogenous bacilli, in that the color formed is not fluorescent. Unlike the B. pyocyaneus found in the green stools of infantile diarrhea, the chromogenous function is not essential to the orange-flower water bacillus. Its color-forming property is accessory, and it may live and develop without forming any pigment. It is an aerobic bacillus. Exposure to air or oxygen favors the development of the green tint. Reducing agents destroy the color. Light favors its appearance, and direct sunlight has a markedly stimulating action on its formation. Antiseptics, as a rule, retard its development. Bismuth subnitrate, which has been recommended as a preservative for distilled water, has no effect on the growth or color product. Water stored in zinc vessels never

shows the green color, and green water is decolorized if stored in them. Zinc oxide has a similar action. Animal charcoal also removes the green tint. The aroma of the water is in no way affected by this color-forming growth. On the contrary, the green waters appear to have a more mellow floral odor than the normal product.—J. pharm. chim.; through Pharm. J., 96 (1916), 165.

CAPSULÆ.

Enteric Capsules.—*Formaldehyzed.*—The investigations of W. L. Scoville led him to the following conclusions regarding the possibilities of rendering gelatin capsules insoluble in the stomach but permitting disintegration in the intestine.

A 1 per cent. solution of formaldehyde (10 mils solution of formaldehyde U. S. P. and 360 mils of water) is used and the soft capsules are immersed, after filling, for about 30 seconds, then quickly drained and dried. For the first week or two they show no appreciable change but after three or four weeks they will be found to be insoluble in warm 0.3 per cent. hydrochloric acid solution but soluble in warm 0.5 per cent. solution of sodium carbonate in from one to two hours.

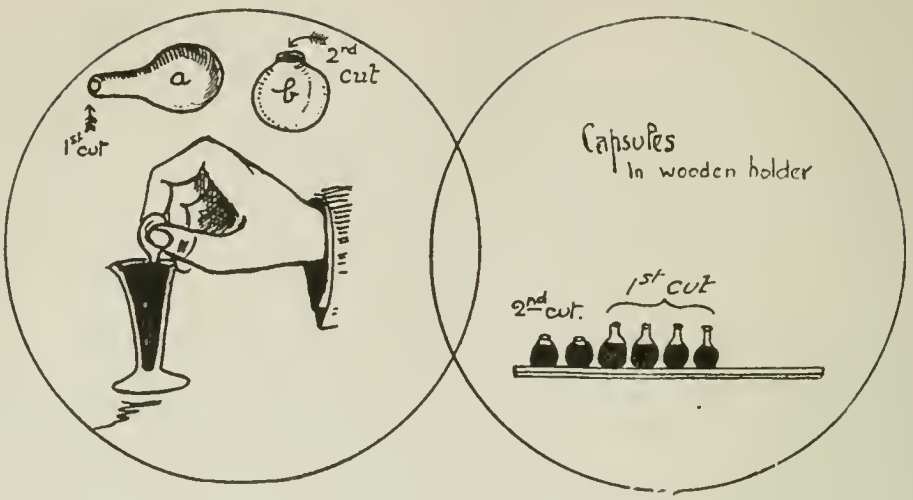
They retain this property for a year or two but after that time are not soluble in alkaline solution. Hard capsules are not satisfactorily treated. The liquid will penetrate between the cap and body and wet the contents. They also wrinkle while soft and do not assume their original shape when dry.—Bull. Pharm. 30 (1916), 76. (C. M. S.)

Soft Capsules.—*Simple Method of Filling.*—Ivor Griffith adopts the principle used in filling a rubber bulb; that is, compressing the capsule, inserting the neck into the liquid and releasing the pressure, when the liquid rises into the capsules to fill the partial vacuum. After being thus filled, the capsule is permitted to drain and a small slice of the neck is cut off to give a fresh surface for the purpose of sealing. The illustrations (page 64) show the procedure followed. —Am. Drug., 64 (1916), 310. (H. J. G.)

Capsules.—*For the Administration of Deliquescent and Liquid Drugs.*—N. S. Davis dispenses potassium iodide and similar drugs, also guaiacol, oil of sandalwood and many other liquids in a capsule by using a wax mass. The capsules are permanent, keeping for

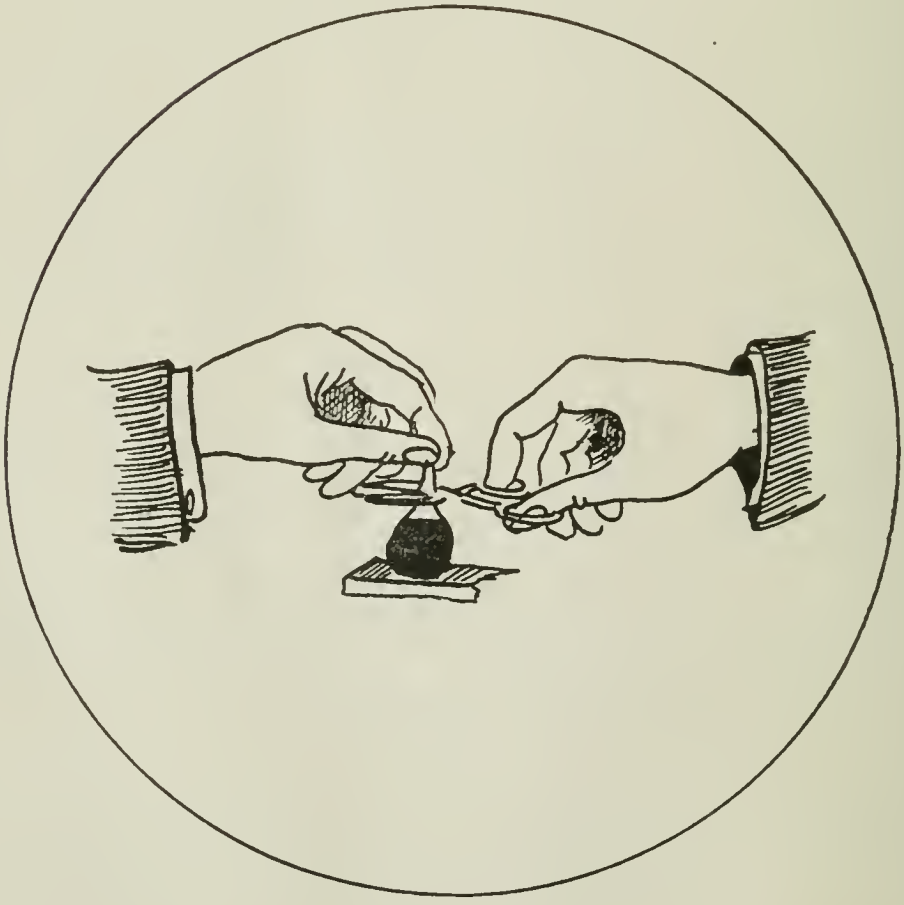
Fig. 17.

Fig. 18.



Filling Capsules.

Fig. 19



Filling Capsules.

weeks, if placed in a corked bottle. For the making of a pill to be placed in a capsule containing sodium or potassium iodide in doses of 10 or 12 grains (from 0.5 to 0.8 Gm.), about $1^1/_2$ grains (0.1 or 0.15 Gm.) of the wax mass are needed; for oil of sandalwood or similar liquids in doses of 5 minims or thereabouts, the same quantity of mass is needed. The wax mass is made of one part beeswax and three parts of castor oil. These ingredients are melted and mixed by heating them gently. When liquefied and thoroughly mixed, the mass is allowed to cool. It makes a somewhat granular pill.—J. Am. Med. Assoc., 67 (1916), 1160. (W. A. P.)

Capsules of Copaiba and Sandalwood.—*Quality of.*—W. Beckers reports on the results of an examination of these as follows: Of eight samples of copaiba capsules examined, only three were found to contain an article meeting all requirements of the German Pharmacopœia. In case of the other five samples the saponification and acid numbers varied considerably from standard. In several instances the admixture of resin and gurjun balsam could be clearly demonstrated. Of the five commercial samples of capsules containing sandalwood oil, one was found to meet requirements as to quality.—Apoth. Ztg.; through C. U. C. P. Al. J., 23 (1916), 186. (G. C. D.)

EMULSA.

Emulsions.—*Physical Significance of.*—At a meeting of the New York branch of the American Pharmaceutical Association, Leo Roon gave a highly interesting address on the physical chemistry of emulsions, in which he summarized the work that is being done by investigators on this very important subject. In view of this work, he feels that the time-honored pharmaceutical definition of emulsions—"aqueous liquid preparations in which oily or resinous liquids are suspended by the agency of gummy or viscid substances"—must be abandoned, since hydrous wool fat is an emulsion of water in wax; an emulsion of chloroform or benzene may be made without the presence of oil or resin; and as to the emulsifier a very diluted soap serves as acceptably as does a gum. The printed paper has a good bibliography of the subject.—J. Am. Pharm. Assoc., 5 (1916), 496.

Emulsion of Cod Liver Oil with Hypophosphites.—*Improved Recipe.*—At the meeting of the Missouri Pharmaceutical Association, A. Mueller stated that while the recipe of U. S. P. VIII was satisfactory he preferred the Irish moss emulsion of the National

Formulary, especially when sweetened with 2 grains of saccharin to the pint.—Pract. Drug., Apr., 1916, 30.

Emulsion of Silver Iodide.—*Preparation.*—At the meeting of the Pennsylvania Pharmaceutical Association J. C. and Bertha Peacock presented a paper on emulsion of silver iodide which was brought to their attention through a prescription calling for a five per cent. preparation. The results of their original work, compared with previous work of Wilbert (1906) and of Thum (1910 and 1915), and with still further experimentation in which mucilages made from sassafras pith, flaxseed, salep, elm, quince, dextrin, starch, acacia, tragacanth, gelatin, egg albumen and Irish moss, showed that the latter agent is the best emulsifier for silver iodide. Since it is an efficient suspending agent, its mucilage is easily and quickly prepared; it gives a permanent emulsion; it is sufficiently viscid although adding only a trifle of solid matter; it is as inert as any other suitable substance and it is inexpensive. The authors find that a smoother emulsion results when a solution of silver nitrate in mucilage is mixed with a solution of potassium iodide in mucilage, than when the silver iodide is prepared by precipitation from aqueous solutions and, after washing, is mixed with the mucilage. If the potassium nitrate resulting from the interaction of the chemicals is objectionable, it can be removed by dialysis.

The paper discusses the molecular proportions involved, and other details of manipulation. By use of the 3 per cent. mucilage of Irish moss N. F., an emulsion containing 10 per cent. of silver iodide can be made. Or the usual five per cent. emulsion may be diluted to any desired strength, either with water or, preferably, with the mucilage.—J. Am. Pharm. Assoc., 5 (1916), 727.

EXTRACTA.

Extracts.— *Uncertainty of Strength.*—E. L. Maines deplores the uncertainty concerning the strength of commercial extracts. While U. S. P. IX provides standards for many of the official extracts, the term "pilular consistence" is indefinite and questionable. Unofficial extracts are markedly irregular as to quality and Maines recommends that the next Pharmacopœia contain a list showing the definite relation of drug to extract for every commercial crude drug.—J. Am. Pharm. Assoc., 5 (1916), 1067.

Green Extracts.—*Change of Color in.*—V. Lyubimenko assumes that the reason for color change in green extracts, while such change does not occur in the green plant, is because of a special enzyme in the plant—an "anti-oxidase"—which protects chlorophyll from the action of light and oxygen, and also from the peroxidase of the tissues, which readily destroys it. In the living plant anti-oxidase accumulates in the plastids in sufficient quantity to counteract the peroxidase. In extracts the equilibrium between the enzymes is disturbed and the pigments are quickly destroyed. During the period of assimilation of the plastids in the living plant the chlorophyll is constantly used up and constantly replaced. The function of the anti-oxidase is to regulate this process, and thus prevent too rapid oxidation.—Bull. Acad. Sci. Petrog.; through Pharm. J., 97 (1916), 505.

Beef Extract.—*Value of.*—Lebbin describes the manufacture of beef extract and expresses the opinion that such preparations are of doubtful value. Among his conclusions are: (1) The yield in extract depends on the age of the meat, old meat giving a higher yield than fresh meat. Yields as high as 5.5 per cent. are obtained, but yields as low as 3 per cent., as reported by the Liebig Company, could not be observed. (2) For preparing the extract, preferably distilled water and never water containing more than 0.01 per cent. of total solids should be used. (3) The ash should vary between 16 and 21.5 per cent. (4) The percentage of sodium chloride should not materially exceed 10 per cent. (5) The amount of phosphoric acid anhydride in the ash should be at least 30 per cent. (6) The percentage of nitrogen should vary between 7 and 8.5 per cent. (7) At least 12.5 per cent. of the total nitrogen should be present in the form of creatinine. (8) Not more than 3 per cent. of the total nitrogen should be present in the form of ammonium salts. (9) Twenty-five per cent. of the total nitrogen should be present as albumoses. (10) An abnormal amount of succinic acid indicates that autolyzed meat has been used for preparing the extract. (11) Lactic acid is present to an extent of about 10 per cent. (12) Liebig's extract is prepared from autolyzed meat, previously treated with hydrochloric acid.—Pharm. Zentralhalle; through Drug Circ., 60 (1916), 407.

Extract of Bladderwrack.—*Detection of.*—The substances in bladderwrack containing the iodine organically combined are soluble in alcohol while those in the thyroid gland are only very difficultly

soluble. Since, however, the cleavage products of the iodine compounds of the thyroid gland are soluble in alcohol, a simple extraction of the product under examination with alcohol does not lead to a conclusion which preparation has been used. Only a large percentage of sodium chloride in the ash (extract of bladder may contain as much as 85 per cent. of NaCl) would indicate the presence of Fucus vesiculosus. For detecting extract of bladderwrack also in the presence of thyroid gland C. Griebel gives the following process: The finely powdered product is extracted two or three times with boiling 70 per cent. alcohol and the alcoholic solution after the addition of 1 to 2 mils of caustic potash solution is evaporated and the residue heated to red heat. The ash is taken up in a small quantity of water and after the addition of a small amount of sodium nitrite solution and diluted sulphuric acid and a few mils of chloroform the mixture is shaken, when in the presence of iodine the chloroform is colored pink to purple. The alcohol-insoluble part is also incinerated after the addition of caustic potash solution and examined as before for the presence of iodine. If the examination of the alcoholic extracts has given negative results, that of the insoluble portion, however, positive results, then extract of bladderwrack is absent and a thyroid gland preparation may be present. If the result is positive in both instances, both products may be present, while when the alcoholic extract alone shows the presence of iodine, extract of bladderwrack most probably is present. —Z. Nahr. Genussm.; through Pharm. Weekblad, 53 (1916), 1363. (H. E.)

Extract of Quillaja.—E. M. Holmes found that the crystalline body in a glycerinic extract of quillaja consisted of a calcium salt of an organic acid resembling quillaic acid but differing from the latter in that it gave no reducing sugar on hydrolysis. The substance was water-soluble and gave a precipitate with a solution of lead acetate and of silver nitrate, but not with barium chloride or barium hydroxide. It gave no reaction with Fehling's solution after boiling with hydrochloric acid.

The author suggests that if the sapogenins are proved to possess acid properties their terminology should be altered.

Mr. Wilson, who submitted the crystals to Professor Holmes, stated that distilled water is preferable for the manufacture of the extract of quillaja if it is desirable to prevent loss of saponin.—Pharm. J., 96 (1916), 220. (F. H.)

Fluidextract of Golden Seal.—*Comparison of Official Recipes.*—J. Blomberg has prepared and examined the fluidextract of golden seal made by the methods of the Dutch Pharmacopœia, the supplement to this pharmacopœia, the two methods of von de Haar published in the "Pharmaceutisch Weekblad," 1911, pages 323 and 1303, respectively, the method of the German Pharmacopœia V, and finally the method of von Ledden-Hülsebosch. He also prepared and examined a fluidextract according to the U. S. P. and has found that a much more efficient product with a higher content of alkaloid is obtained by this method than by any one of the others. He ascribes this to the presence of the glycerin which apparently has a special action on the cell walls and permits the alcohol therefore to extract the alkaloids more thoroughly. He found that a fluidextract prepared according to the Dutch Pharmacopœia assayed 2.6 per cent. of hydrastine while the amount of hydrastine present in a product prepared according to the U. S. P. was 3.2 per cent. He states, however, that when applying to the fluidextract prepared by the latter method von Ledden-Hülsebosch's assay process great care should be taken to eliminate all the glycerin as otherwise too high results are obtained.— Pharm. Weekblad, 53 (1916), 470. (H. E.)

Fluidextract of Sabal.—*Characteristics.*—C. Griebel finds that fluidextract of saw palmetto has the density of 0.9142 at 15° and yields 25.59 per cent. of solid matter of which 10.12 per cent. is ether-soluble raw fat and 0.3 per cent. is mineral matter (0.18 per cent. sodium chloride). The esters present are ethyl compounds of caproic and other fatty acids. The fat-free portion of the solid matter consists chiefly of invert sugar and mannose.—Apoth. Ztg., 31 (1916), 306; through Chem. Abstracts (1917).

Fluidextract of Senega.—*Improved Recipe.*—Bertha Mueller finds the official fluidextract of senega an unstable preparation, becoming acid and developing a wintergreen odor on standing. She also finds that when senega is first scalded with boiling water and then dried, the drug is stabilized without any loss of activity whatever. Acting on these principles, she has devised the following recipe for a fluidextract that she finds highly satisfactory: Pour 2000 mils of boiling water on 1000 grammes of senega in a 30 powder. Mix, macerate for 6 to 8 hours, then dry at a moderate heat. Then

exhaust with diluted alcohol making a fluidextract by official directions. Neutralize the finished fluidextract with potassium hydroxide solution until faintly alkaline.—Am. J. Pharm., 88 (1916), 241.

INFUSA.

Infusion of Digitalis.—*Modified Recipe.*—Geo. A. Stall states that while in preparing the official infusion of digitalis, the pharmacopœia recommends that boiling water be allowed to act on the drug one hour, the usual method employed is to pour boiling water upon the drug in a white porcelain jar, the temperature of the water being reduced materially by the cold jar. If the jar is previously heated with hot water a finer preparation results.—Pract. Drug., May, 1916, 27. (H. J. G.)

Compound Infusion of Senna.—*Modified Recipe.*—The Dutch Pharmacopœia directs that to 80 mils of infusion of senna in addition to other ingredients 10 Gm. of Rochelle salt be added. T. C. N. Broeksmit found that in a product thus prepared, a continuous precipitation of calcium tartrate takes place. When the Rochelle salt is replaced by 5 Gm. each of sodium citrate and potassium citrate no precipitate is produced, while when 10 Gm. of magnesium sulphate (as is used in the U. S. P.) is added, calcium sulphate is formed. When, however, the mixture is allowed to stand for three days and when the precipitate is removed by filtration the mixture remains clear. The author recommends rendering the infusion sterile by the addition of 80 milligrammes of thymol in one mil of alcohol.—Pharm. Weekblad, 53 (1916), 1600. (H. E.)

LINIMENTA.

Camphorated Oil.—*Toxicity of.*—A correspondent of the "Modern Druggist" points out the danger likely to result from careless handling of camphorated oil, citing a case where a two-year-old child died after being given a teaspoonful of the oil in mistake for castor oil. He thinks camphorated oil should always be labelled "Poison."—Drug. Circ., 60 (1916), 85.

LIQUORES.

Medicinal Solutions.—"*Stabilization*" *of.*—James Burmann, Jr., uses the Ringer-Locke serum for the preparation of such solutions, the isotonicity of which is verified by the cryoscopic method. Air is removed from the solutions by high evacuation below 0°, then

replaced by chemically pure nitrogen. The solutions always in an atmosphere of nitrogen are then filtered through a collodion membrane so as to exclude any microbes. Samples of indigo exactly decolorized by $Na_2S_2O_4$, a neutral solution of 2 per cent. pyrogallol and a solution of a 0.1 per cent. of adrenaline, when treated by this process, remained colorless and unaltered after 6 months. The process developed for adrenaline, cocaine, novocaine and stovaine, also applies to caffeine, morphine and all other alkaloids.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 10 (1916), 2614.

Intravenous Solutions.—*History and Preparation.*—At a meeting of the Denver branch of the American Pharmaceutical Association, M. Becker read a paper on intravenous solutions, pointing out that the transfusion of blood was practiced by the ancient Egyptians and that the intravenous administration of drugs (opium and "crocus metallorum") was first performed by Christopher Wren in 1657. The unhygienic methods employed at that time made this form of medication unfeasible and it has been revived only recently. The rest of the paper describes the filling and sterilizing of ampuls containing solutions for intravenous use.—J. Am. Pharm. Assoc., 5 (1916), 846.

Isotonic Solutions.—*For Ingestion into the Stomach.*—L. Meunier states that although the importance of employing only isotonic solutions for injections is fully recognized, the same is not the case for medicines administered by the mouth. Yet there is no doubt that if such were administered in solutions isotonic with the stomach contents, at a given time, they would be more promptly evacuated from that organ, and therefore be less likely to cause gastric disturbance. It is found that the cryoscopic degree of the stomach contents, which oscillates widely immediately after ingestion of food, settles down ultimately to $\Delta = 0.35$. Consequently solutions of salts should be administered at approximately the same cryoscopic degree. The following are the percentage strengths of solutions of the substances named, which will have the cryoscopic point of Δ 0.35, and therefore be isotonic with the stomach contents: Sodium bicarbonate, 0.9; dry sodium bitartrate, 2; sodium phosphate, 1.1; potassium bromide, 2; sodium chloride, 0.55; peptone, 4; sugar, 6; hydrochloric acid, sp. gr. 1.171, 0.935; phosphoric acid, sp. gr. 1.349, 2.68; potassium iodide, 1.5; glucose, 3.2; sodium salicylate, 1.55; dry sodium sulphate, 1. The Grande Grille spring at Vichy has the cryoscopic degree Δ 0.34.—Bull. Sci. Pharm.; through Pharm. J., 97 (1916), 569.

Anesthetic-Hemostatic Solution.—Legrand and Dumont suggest the following recipe for a solution which they claim is valuable in dental surgery in that it produces hemostasia of the gums through the formation of a fibrinous coagulum immediately after the extraction of teeth:

Gelatin, 2 grammes; sodium chloride, 0.10 gramme; phenol, 0.10 gramme; beta-eucaine, 0.70 gramme; cocaine hydrochloride, 0.30 gramme; distilled water, enough to make 100 mils.

The solution is quite stable if sterilized and sealed in ampuls. It solidifies at ordinary temperatures but becomes fluid at 25° and may therefore be readily injected.—Bull. Chem. Pharm.; through Chem. Abstracts, 10 (1916), 2026.

Solution of Bismuth and Ammonium Citrate.—*Improved Manufacture.*—Frederick Penfold says in his paper that when the method of the B. P. 1914 is followed three difficulties *always* arise: there is some opalescence when testing the mixture for solubility in a solution of ammonia; a hardening of the mixture almost equal to plaster of Paris; an unsatisfactory product because of opalescence or, if filtered, its failure to meet the official requirement that 10 mils shall yield 0.5 Gm. of bismuth oxide on evaporation and ignition.

Acting on a suggestion of Mr. William Duncan, all these obstacles were overcome. Instead of 20 mils of distilled water 80 mils are used with the 70 Gm. of bismuth oxynitrate and 52 Gm. of citric acid to make the initial mixture and this is allowed to stand until an ammonia-soluble citrate is produced, two hours or more if necessary. Then the remainder of the water is added *gradually*, this being necessary to prevent possible hydration.

By increasing the distilled water the nitric acid present in the mother liquor is so diluted that it does not interfere with the formation of bismuth citrate, the undissolved matter in the official preparation being due probably to unconverted subnitrate, because of the concentration of nitric acid and to hydrate due to careless addition of water and probably also to the hydrating action of water during the washing by decantation. Mr. Penfold recommends washing on a filter. The hardening of the mixture is obviated by the increase of the water, the mixture being of the consistence of thin cream. Opalescence in the finished preparation or deficiency in strength disappears if care is taken to have the product of the reaction soluble.—Pharm. J., 97 (1916), 567. (Z. M. C.)

Solution of Chlorinated Soda.—*Cause of Pink Color in.*—It is frequently noted that solutions of chlorinated soda turn pink on standing. H. G. Elledge now shows that this tint is due to the presence of small amounts of sodium permanganate, derived from a manganese contamination of the bleaching powder used in making Labarraque's solution.—J. Ind. Eng. Chem., 8 (1916), 780.

Surgical Hypochlorite Solution.—*Preparation.*—M. Daufresne is one of the workers at the hospital of the Rockefeller Institute at Compiègne, in charge of Carrel, and he gives the minute details for the preparation of Dakin's antiseptic fluid and for a modification of it which has been more recently used at the hospital, instead of the original Dakin's solution. He expatiates on the difference between the Dakin, Labarraque and Javel formulæ, and reports results of tests showing the difference of their action on phenolphthalein and on the skin. To make 10 liters of the modified Dakin solution he weighs exactly 200 Gm. of chlorinated lime (with exactly 25 per cent. active chlorine by test), 100 Gm. anhydrous sodium carbonate, and 80 Gm. sodium bicarbonate. The 200 Gm. chlorinated lime are placed in a 12-liter jar with 5 liters of ordinary water, shaking the whole thoroughly two or three times and setting it aside over night. In another jar the sodium carbonate and bicarbonate are dissolved cold in 5 more liters of water, and then the contents of this jar are poured at one time into the jar containing the maceration of chlorinated lime. The whole is vigorously agitated for one minute and then set aside for the carbonate to settle. After half an hour, the clear fluid is siphoned off and filtered through two layers of paper. The limpid fluid thus obtained is then ready for use. It is kept in a cool place sheltered from the light. It should contain from 0.45 to 5 per cent. sodium hypochlorite with small amounts of neutral sodium salts. The solution is isotonic to the blood serum. The boric acid of Dakin's original solution has been dropped. Each purchase of chlorinated lime is tested anew for the proportion of active chlorine and if it is found below or above 25 per cent. the proportions of the three ingredients used must be altered to correspond, multiplying each of the three figures, 200, 100, 80, by the factor 25/N, N representing the active chlorine by weight in 100 Gm. of the chlorinated lime. This proportion is determined by mixing 20 Gm. with a liter of water and setting aside for several hours. To 10 mils of the limpid fluid, he adds 20 mils of a 10 per cent. solution of iodide and 2 mils of acetic or hydrochloric acid, and then drops into the mixture, one drop at

a time, a decinormal solution of sodium thiosulphate until discoloration ensues. The number of mils of thiosulphate used, multiplied by 1,775, give the amount by weight, N, of the active chlorine in 100 Gm. of the chlorinated lime. The chemical and biologic actions involved are described. (Presse Médicale; through J. Am. Med. Assoc., 67 (1916), 1795. (W. A. P.)

Cresol Soap Solutions.—*Bactericidal Action of.*—R. Vivario has examined samples of Liquor Cresolis Compositus of the Dutch Pharmacopœia, the U. S. P., the British Pharmacopœia, the German Pharmacopœia and the Swiss Pharmacopœia in addition to the preparation given in the French Codex which is a mixture of equal weights of crude cresol and 30 per cent. sodium hydroxide solution. The experiments were carried out according to the method of Paul and Kroenig. It was found that the bactericidal actions of the cresol preparations which are obtained by the methods of different pharmacopœias are practically alike; that these preparations killed Bacterium pyocyaneum within 30 minutes; that, however, even after 18 hours they are not able to kill the sporogenous Bacillus mesentericus.—Pharm. Weekblad, 53 (1916), 629. (H. E.)

Compound Solution of Cresol.—*Without Glycerin.*—On account of the scarcity of glycerin in Germany various preparations which ordinarily contain glycerin have been manufactured without this substance. Thus Richter reports the following process for making compound solution of cresol: One hundred and fourteen grammes of fatty acids obtained from linseed oil are mixed with 18 grammes of alcohol, and to the mixture a solution of 27 grammes of potassium hydroxide in 41 grammes of water is added. After allowing to stand for five minutes the mass is mixed with 60 grammes of cresol until a uniform product is obtained and then 140 grammes more of cresol are dissolved in the liquid. Thus a clear, red-brown oily liquid with a specific gravity of 1.020 was obtained which formed clear solutions with water, glycerin and alcohol.—Apoth. Ztg.; through Drug. Circ., 60, (1916), 211.

Liquor Ferri Caseinati.—*Modified Recipe.*—On the basis of careful investigations, Neilsen gives the following formula for preparing a stable solution of caseinate of iron: Five per cent. of sodium caseinate and 10 per cent. of iron saccharate, free of alkali, are mixed dry and stirred with half the weight of water. The remainder of the water is then added, and the whole boiled for some

minutes. After cooling, 10 per cent. of strong alcohol is added, and the mixture filtered through gauze or cotton. An alternative formula calls for 2 per cent. of casein, 10 per cent. of iron saccharate, and 10 per cent. of alcohol.—Archiv for Pharm. og Chemi.; through Pharm. Era, 49 (1916), 193.

Solution and Tincture of Ferric Chloride.—*Preservation of.*—According to C. E. Carlson, the keeping qualities of these preparations depend upon exact neutrality. They should be tested for oxychloride and for excess of acidity by the methods of the German and the United States Pharmacopœias. Solutions carefully neutralized by drops of 25 per cent. hydrochloric acid remained clear for over one year.—Svensk Farm.; through Chem. Abstracts, 10 (1916), 1908.

Lime Water.—*Sulphides in.*—Jeannot Hostmann reports upon a sample of lime water which when mixed with aspirin had a distinct odor of hydrogen sulphide. Investigation proved that the lime water had been made from U. S. P. lime in the proper manner. A "two bottle" container was used with red rubber tubing for connections. The antimony sulphide in the red rubber was attacked by the alkaline lime water. There was no perceptible odor of hydrogen sulphide until the sample was acidified.—C. U. C. P. Al. J., 23 (1916), 5. (J. H.)

Solution of Magnesium Citrate.—*Modified Recipe.*—C. Blomberg reports that magnesium citrate solution prepared strictly according to the Dutch Pharmacopœia frequently has too acid a taste and that this is due to the inferiority of the magnesium carbonate for which the pharmacopœia does not give any requirements. He therefore proposes the following formula: 14 Gm. of citric acid are dissolved in 150 mils of warm water and the solution is neutralized with magnesium carbonate of which 9.4 to 10.1 Gm. are used. To the solution 1.4 Gm. of citric acid, 25 mils of simple syrup and water enough to make 200 mils are added, followed by one mil of spirit of citric acid.—Pharm. Weekblad, 53 (1916), 1382. (H. E.)

Solution of Magnesium Hypochlorite.—Duret states that the following solution is isotonic with blood serum:—

Chlorinated lime	28 Gm.
Magnesium sulphate	18.20 Gm.
Water	1,000 Gm

The two salts are triturated in a mortar, and the water added by degrees; the sodium is then filtered through cotton wool. The solution is very stable, much more so than Labarraque's or Dakin's solution. In contact with wounds it liberates its chlorine gradually, and it retains its antiseptic properties for a long time. It is in no way harmful to the cells, for it is free from irritating substances like boric acid and the borates. For use it should preferably be warmed to 95° F.—J. Med. Chir. Pract.; through Pharm. J., 97 (1916), 526.

Solution of Potassium Arsenite.—*Possible Cause of Deficiency.*—Dallande suggests that the cause of sub-normal Fowler's solution may be the fact that in following the pharmacopœial directions (boiling the arsenic trioxide and the potassium bicarbonate together in a tared dish) the bursting of the bubbles of carbon dioxide and of steam at the surface of the liquid may cause the expulsion of some of the arsenic trioxide. Were the two chemicals boiled together in an Erlenmeyer flask, this loss might be avoided.—National Drug Clerk; through Drug. Circ., 60 (1916), 85.

Liquor Picis Acetonatus.—The following recipe is given for the above-named preparation, which is also sometimes called "Pix Sach."

Pix Lithanthracis	10
Benzolum purum	20
Acetonum purissimum	70

Vierteljahrsschr. f. prakt. Pharm.; through Pharm. Zentralhalle, 57 (1916), 98.

MAGMÆ.

Magma of Magnesia.—*Improved Recipe for.*—At a meeting of the Philadelphia branch of the American Pharmaceutical Association, W. W. McNeery gave the following recipe for this popular preparation:

Place 9212.46 grains of magnesium carbonate in a mortar and triturate with sufficient water to make a smooth mixture. Dissolve 6256.08 grains of sodium hydroxide in sufficient water to make 32 fluidounces of solution. Add the latter solution to the former mixture; pour into a large container and wash by decantation or syphoning until the supernatant liquid is neutral to litmus. Then allow the precipitate to subside until its volume is one gallon, withdrawing the liquid above.

If a slight excess of alkali is used for the reaction, and the precipitate is carefully washed, the product is practically free from carbonate. The product is smooth, white and creamy.—J. Am. Pharm. Assoc., 5 (1916), 611.

MISTURÆ.

Sun Cholera Mixture.—*History of.*—At the meeting of the New Jersey Pharmaceutical Association, Otto Raubenheimer read a paper in which he brought out the fact that during the cholera excitement of 1849 G. W. Busteed, a druggist of New York, sent the recipe to the editor of the New York "Sun," who had it published in his paper. The recipe met with great success and was printed in about 1000 issues of the "Sun" between 1849 and 1892. It was printed in the first edition of the National Formulary and is found in the present (fourth) edition in slightly modified form.—J. Am. Pharm. Assoc., 5 (1916), 624.

Cholera Mixture.—*Improved Recipe for.*—Otto Raubenheimer states that there is still a demand for cholera mixtures, such as Squibb's mixture and Sun cholera mixture. The latter is the most important but as it contains 20 per cent. of tincture of opium it cannot be sold without a physician's prescription. He therefore suggests a modified recipe calling for 2 volumes of spirit of peppermint, 1 volume of spirit of camphor, 1 volume of tincture of capsicum, 1 volume of tincture of rhubarb and 5 volumes of camphorated tincture of opium. This will contain only 0.2 per cent. of opium.—Drug. Circ., 60 (1916), 481.

OLEATÆ.

Oleate of Mercury.—*Electrolytic Assay of.*—B. L. Murray recommends the following procedure for this mercurial preparation, the greasy character of which makes usual methods of assay somewhat inconvenient:

Between 0.7 and 1.0 gramme of the oleate is weighed directly into a mercury cathode cup (such as a small beaker of 60 to 75 mils, capacity). To this are added 15 to 20 mils of 10 per cent. hydrochloric acid, and 15 mils of toluene. The cup is now placed in a somewhat larger crystallizing dish or beaker. After attaching the anode and making the connections, electrolysis is begun, gradually and slowly increasing the current up to 3 amperes, using about 10 minutes to do it. The current (3 to 3.5 amperes at about 8 volts) is then maintained for about thirty minutes, the anode rotating at about 800

revolutions per minute. Heating will occur at this stage, but if the contents show signs of boiling over, water must be run into the surrounding vessel, but it should not cool below 60° C. When the mercury is all deposited, the cathode cup is washed out by syphoning with water, after which the metallic mercury is washed with alcohol, dried with ether, and finally weighed.—J. Ind. Eng. Chem., 8 (1916), 257.

OLEORESINÆ.

Oleoresin of Aspidium.—*Requirements and Tests of Identity.*—In a lengthy paper, G. Gluecksmann reviews the literature on extractum filicis maris and reaches the following conclusions:

Questions for the revision committees of the Pharmacopœias:

(*a*) Should the oleoresin be prepared exclusively from the fresh rhizome, which is not dried?

(*b*) Are rhizomes with a *dark green* fracture preferable to those of a *light green* fracture?

(*c*) Is ether the best solvent?

Gluecksmann also proposes the following tests of identity: Dissolve 0.2 Gm. of the oleoresin in 20 mils of 95 per cent. alcohol, applying a gentle heat, and then filter.

I. 1 mil of this solution (1:100) diluted with 9 mils of alcohol produced a light green mixture, which upon the addition of 1 drop of ferric chloride T. S. (1:10) gives a brown color (phenol reaction, which does not affect oleoresin of cubeb or extract of cannabis indica).

II. 10 mils of the solution with 10 drops of fuming hydrochloric acid give a cloudy greenish mixture, which, when evaporated to about 3 mils, turns dark wine-red. When this is diluted with alcohol to 10 mils and filtered, a light red solution will result and a greenish black oil will remain on filter (difference from oleoresin of cubeb and extract of Indian hemp). If 1 mil of this red solution is diluted with 9 mils of alcohol and 3 to 5 drops of ammonia water are added, the following color changes take place: light blue-green, brown-green and then brown-yellow (Felix-tannin).—Ph. Presse, 1916, 295. (O. R.)

PASTÆ DERMATOLOGICÆ.

Unna's Paste for Varicose Veins.—In the treatment of varicose ulcers of a mild form Dr. Ochsner prepared a boot composed of several layers of a bandage, each treated with Unna's paste applied

hot. The paste consists of gelatin 4 parts dissolved in 10 parts hot water to which 10 parts glycerin and 4 parts zinc oxide are added. —J. Am. Med. Assoc., 67 (1916), 1617. (W. A. P.)

PILULÆ.

Excipient Powder.—In making pills from liquids or viscous substances, L. Danzel uses the following powder:

Powdered licorice root, 40; powdered tragacanth, 20; powdered almond oil soap, 20; wheat groats starch, 12; powdered sugar, 6; hydrated magnesia, 6; mix. Liquids or viscous substances may be massed with the above alone. Powders should first be well mixed with a little of the excipient, then massed with honey or with gum julep.—Drug. Circ., 60 (1916), 486.

PULVERES.

Almond Meal.—E. E. Williams recommends a mixture of 16 ounces of blanched and powdered almonds, 8 ounces of powdered orris, 16 ounces of rice flour, 2 ounces of dried and powdered soap, 2 ounces of powdered borax and enough oil of bitter almonds to give the proper perfume.—Am. Drug., 64 (1916), 489.

RESINÆ.

Resin Jalap.—The eighth revision of the United States Pharmacopœia states that resin of jalap should contain not more than 35 per cent. of resin soluble in chloroform but does not give a method by which it should be determined. J. Paul Snyder has made an exhaustive study of the various methods used by different manufacturers to determine this factor and finds that the quantity depends entirely upon the method by which it is extracted. His own experiments demonstrated the fact that if extracted with a Soxhlet apparatus the yield of a given specimen reputed to be of U. S. P. quality assayed 98.5 per cent. and the same specimen assayed by reflux method gave a result of only 41.3 per cent. The writer concludes that the U. S. P. requirement is very indefinite and suggests that the U. S. P. IX give a method by which the chloroform resin content is to be determined, so that chemists in different sections would be able to secure concordant results.—J. Am. Pharm. Assoc., 5 (1916), 34. (L. S.)

Resin of Podophyllum.—*Evaluation of.*—H. Tanzen examined 12 samples of American podophyllin by the methods suggested by Kremel, Jenkins, Gordin, Merrell, Umney and the Dutch Pharmacopœia. He finds the latter assay the most practical, it directing a minimum podophyllotoxin content of 40 per cent.—Arch. Pharm., 254 (1916), 44; through Chem. Abstracts (1917).

SAPONES.

Soap.—*History, Manufacture and Uses.*—At a meeting of the Detroit branch of the American Pharmaceutical Association, Joseph Abraham read an interesting paper on soap. He discusses the crude soap, cleansing methods used by the ancient Hebrews, Greeks and Romans; he cites the claimed discovery of soap by the Gauls; he traces the development of the soap industry in Venice, Marseilles, Lyons and in England. He then describes the various modern methods of manufacture and discusses its wide use as a detergent and antiseptic.—J. Am. Pharm. Assoc., 5 (1916), 205.

Soap.—*Determination of Free Alkali in.*—F. H. Newington takes 10 grammes of soap in a wide-mouthed flask, adds 50 mils of water and heats until solution is effected. The soap is then "salted out" by addition of 50 mils of hot saturated solution of sodium sulphate. The mixture is then filtered and the precipitate is washed with sodium sulphate solution; finally the filtrate and washings are titrated with tenth-normal sulphuric acid, silver nitrate being used as indicator by the spotting method (brown silver oxide showing as long as free hydroxide remains in the titrated solution). Carbonates and silicates do not interfere with the process, which is sensitive enough to detect 0.01 per cent. of alkali added to a neutral soap.—J. Soc. Chem. Ind.; through Am. J. Pharm., 88 (1916), 262.

Soap Substitute.—A product which has successfully been used as a substitute for soap is prepared according to Schneider by the following process: One hundred grammes of soap bark are heated on a water-bath for a half hour with 300 grammes of water, the mixture strained, the liquid mixed with 400 grammes of kaolin and 400 grammes of powdered talcum, and the resulting paste perfumed with any suitable substance. The paste does not froth, but cleanses the hands, it is said, better than ordinary soap.—Pharm. Zentralhalle; through Drug. Circ., 60 (1916), 407.

Tar Soap.—*Manufacture.*—Doenhardt recommends for making tar soap the use of birch tar which is more uniform in composition than the ordinary commercial wood tar. Twenty-five parts of oleum rusci are mixed with 18 parts of 35 per cent. caustic potash solution and 20 parts of rapeseed oil or linseed oil, the mixture is heated until saponification has taken place and the soap is then dissolved in a mixture of 25 parts of alcohol and 10 parts of water.—Pharm. Ztg.; through Drug Circ., 60 (1916), 213.

War Soap.—Dr. Freund states that soft soap in tubes is better for soldiers' use then hard soap, and gave the following formulæ for it, but the famine has since arisen:

	Gm.		Gm.
Suet	8,000	Glycerin	2,000
Sesame oil	5,000	Water	200
Potassium hydroxide sol. 38° B.	6,500	Linseed-oil soft soap	1,400
Glycerin	2,500	Castile soap	400
Water	2.000	Alcohol (90 per cent.)	200
Oil of turpentine	160	Yellow beeswax	200
Oil of bois de rose	20	Oil of cassia	a sufficiency
Heliotropin	8		
Oil of ylang-ylang	8		
Cananga oil	40		
Coumarin	40		

He added that glycerin soap made from palm oil or coconut oil is best for hospital use.—Pharm. Zentralhalle; through Chem. and Drug., 88 (1916), 62.

SPIRITUS.

Aromatic Spirit of Ammonia.—*Use in Shock.*—Horatio C. Wood, Jr., explains that any stimulating effect which may be observed after the oral administration of aromatic spirit of ammonia is due either to a psychic effect or to its local irritant action on the gastric mucosa, just as the irritation by ammonium carbonate, in the form of smelling salts, of the mucous membrane of the nose may reflexly excite the medulla.—J. Am. Med. Assoc., 67 (1916), 231. (W. A. P.)

Spirit of Camphor.—*Optical Rotation of.*—J. C. Umney states that he found the highest rotation (+42° 20′) in a spirit containing 5 Gm. camphor in enough 90 per cent. alcohol to make 100 mils. The optical activity decreased as water was added and also decreased in a spirit of the same alcoholic strength as the amount of camphor was increased.—Perf. Essent. Oil Record; through Chem. Abstracts, 10 (1916), 1403.

Spirit of Camphor.—*Evaluation of.*—L. Krauss tabulates results of the examination of a large number of samples of spirit of camphor. He states that the use of synthetic camphor may be detected by the iodine absorption number. One hundred grammes of synthetic camphor absorb 3.3 grammes of iodine in 24 hours, while the same amount of natural camphor absorbs only 0.762 gramme in the same time.—Sudd. Apoth. Ztg., 56 (1916), 248; through Chem. Abstracts (1916).

Spirit of Camphor.—*Assay of.*—C. Kollo suggests an assay based on the precipitation of the camphor from its solution with lead subacetate solution, solution of the precipitate in a weighed quantity of ether and calculation of the amount of camphor by the increase in weight of the solution. This is accomplished by taking 20 mils of the spirit, adding 80 mils of lead acetate solution and 20 mils of ether, shaking, separating the aqueous layers and filtering the ethereal layer through cotton, after which exactly 10 mils of the ethereal solution are weighed. A blank is then run with 70 per cent. alcohol (the solvent used in Roumanian Pharmacopœia for spirit of camphor) and 10 mils of the ethereal layer are weighed.—Bulletin dex Chim. Bukarest, 18 (1916), 44; through Chem. Abstracts (1917).

Extracts of Lemon and Orange.—*Examination of Non-Alcoholic Types.*—E. L. Redfern describes the new non-alcoholic flavoring extracts made by suspending the volatile oil in a glycerinic mucilage of tragacanth. Preparing an extract of this type by making 150 mils of mucilage of tragacanth and adding to it 40 mils of glycerin and 10 mils of oil of lemon, he experimented with various assays of its oil content and devised the following method: In a 200 mil Erlenmeyer flask, 25 mils of the extract and 25 mils of alcohol are mixed and are vigorously shaken. The precipitated gum is separated by filtration on a Gooch crucible, the alcoholic filtrate being collected in a 100 mil graduated flask, the gummy residue being washed with alcohol until 100 mils of filtrate were obtained. The oil content of this alcoholic extract was then determined by the Howard method ("J. Am. Chem. Soc.," 30 (1908), 608) which consists in treating the extract in a Babcock milk bottle with water, hydrochloric acid and small amounts of chloroform and ether and "twirling" after warming and other manipulation, the oil being read off as the butter is in a milk analysis. Redfern found this method gave very satisfactory results with both lemon and orange extracts. —J. Ind. Eng. Chem., 8 (1916), 421.

Spirit of Nitrous Ether.—*Deterioration on Aging.*—H. H. de Wolff finds that even a small amount of air in the container causes a rapid deterioration of this spirit and that it should therefore be kept in small, brown well-stoppered bottles which are filled as completely as possible. He compared various methods of assay of ethyl nitrite and of aldehyde and finds the gasometric nitrite assay the best. The aldehyde assays were all doubtful.—Pharm. Weekblad; through Chem. Abstracts, 10 (1916), 2123.

Spirit of Nitrous Ether.—*Preservation of.*—Kebler, Palkin and Ewing in a systematic series of experiments show that for all ordinary purposes the U. S. P. spirit of nitrous ether does not offer any great difficulties in order to be kept up to the standard strength, provided it is made up to the proper strength to begin with, carefully bottled, and stoppered with paraffined corks. If the spirit is prepared with 95 per cent. alcohol, it is best to store it in a refrigerator or in small amber containers kept in diffused light. If stored in large amber bottles kept in diffused light, it is best to use absolute alcohol in its preparation. The observations have demonstrated that *properly prepared* spirit of nitrous ether is comparatively stable and can be kept without material change much longer than the average pharmacy would ordinarily keep it.—J. Am. Pharm. Assoc., 5 (1916), 514.

Spirit of Nitrous Ether.—*Assay and Keeping Qualities of.*—Engelhardt and Winters disagree with Kebler, Palkin and Ewing (see above) that spirit of nitrous ether can be satisfactorily preserved in one-ounce completely filled bottles. They show assay figures that indicate that when even so preserved, a 4.44 per cent. spirit is reduced to 3.58 per cent. in 3 months; a 4.2 per cent. spirit is reduced to 3.26 per cent. in 11 months; a 4.21 per cent. spirit is reduced to 3.16 per cent. in 21 months; a 4.4 per cent. spirit is reduced to 1.34 per cent. in 26 months; and a 4.27 per cent. spirit is reduced to 1.17 per cent. in 38 months.

As to assay methods, they find the Dietze volumetric method more accurate than the official gasometric assay. They point out sources of error in the official assay and state that a nitrometer and a barometer are not usually found in drug stores. The Dietz method is given in the Dutch Pharmacopœia and consists in adding to a mixture of 10 mils of distilled water and 5 mils of cold aqueous solution of potassium chlorate, 5 mils of the spirit and 5 mils of 10 per cent. nitric acid. After shaking in a glass-stoppered bottle

during one-half hour, 15 mils of tenth-normal silver nitrate V. S. and some ferric alum solution are added and the excess silver is then titrated back with tenth-normal potassium sulphocyanate V. S. Each mil of silver nitrate solution used by the spirit multiplied by 0.022353 gives the amount of ethyl nitrite in 5 mils of spirit.—J. Am. Pharm. Assoc., 5 (1916), 1327.

Spirit of Nitrous Ether.—*Quality in the Northwest.*—D. D. Turner, in a paper read before the Minnesota Pharmaceutical Association, relates how he collected samples of spirit of nitrous ether in cities in the west. Fourteen samples were collected and a table is appended showing the per cent. of ethyl nitrite in these samples which varied from 0.25 per cent. to 3.90 per cent. He also describes the different modes of wrapping the bottles. Only one was neatly wrapped and the author remarks that the neatness of a package is about the only basis the public has of judging the ability of a druggist.—Drug. Circ., 60 (1916), 268. (H. H. S.)

Spirit of Peppermint.—*Assay of.*—H. L. Thompson points out that while the method suggested for the assay of spirit of peppermint by "salting out" with hydrochloric acid is good in calculating the volume of oil, it does not show whether the oil employed was of official quality. He prefers to use water from the separating fluid and letting the diluted mixture stand long enough to permit proper separation of the oil. This oil can then be removed from the aqueous layer and assayed for menthyl acetate and for menthol. The aqueous layer can then be used for determining the alcohol content of the spirit. If hydrochloric acid is used as the "salting out" chemical, the menthyl acetate of the oil is destroyed.—Am. J. Pharm., 88 (1916), 303.

Whisky and Brandy.—*Pharmacopœial Standards for.*—In presenting monographs for these two liquors with the suggestion that they be adopted by the U. S. P. IX, Geo. M. Beringer first reviews their manufacture, and considers the difference in the product which the public has been educated to expect, from the original crude whiskies and brandies which were formerly sold. He analyzes the definitions of the U. S. P. VIII and gives reasons for suggesting changes which will bring them more in conformity to what they have really become to mean. The tests have been criticized and modifications or more accurate ones suggested. It is to be understood that the monographs offered are intended for whiskey and brandy when used for "medicinal purposes" only.

In the article, Mr. Beringer gives in detail, monographs for whisky and brandy as he thinks they should appear in the Pharmacopœia.—J. Am. Pharm. Assoc., 5 (1916), 54. (L. S.)

Whisky and Brandy.—*Omission from U. S. P. IX.*—In a paper read at a meeting of the Missouri Pharmaceutical Association, A. N. Doerschuk expressed regret over the deletion of whisky and brandy from the Pharmacopœia. He believes that pure whisky and brandy, properly used, are good medicines, whose place cannot be taken by other drugs. He argues that manufactured "blends" are the things that have brought the real articles into disrepute. He then pays his respects to "blends" in picturesque language.—Drug. Circ., 60 (1916), 481.

SYRUPI.

Syrups.—*Inversion of Cane Sugar in.*—At the meeting of the New York Pharmaceutical Association, J. L. Mayer reported a continuance of his experiments of the preceding year (see Year Book, 1915, 58) tabulating the continued reduction in the samples of syrup U. S. P. studied by him. His last figures show 31.56 per cent. of invert sugar in the hot process syrup and 41.097 per cent. in the cold process syrup.—Pract. Drug., Aug., 1916, 29. (H. J. G.)

Syrup of Acacia.—*Assay.*—Luce found Bellier's process for estimating acacia in syrup of acacia accurate for practical purposes. Twenty grammes of the syrup, exactly weighed, are transferred to a 100-mil flask with the aid of 50 mils of distilled water, the mixture is heated on a water-bath for one-quarter hour and, after cooling, water is added to the flask to the mark. To 20 mils of the solution 40 mils of alcohol are added gradually, and with constant stirring, followed by 1 mil of a 10 per cent. calcium chloride solution. The mixture is allowed to stand for twenty-four hours, the supernatant liquid is decanted, the precipitate washed three times with 60 mils of 65 per cent. alcohol and finally transferred to a counterpoised filter with the aid of alcohol of the same strength. Filter and residue are then dried to constant weight. The weight multiplied by 28.4 gives the percentage of acacia in the syrup.—J. pharm. chim.; through Drug. Circ., 60 (1916), 607.

Syrup of Ammonium Hypophosphite.—F. A. Upsher Smith in a paper presented before the Minnesota Pharmaceutical Association presents a formula for the manufacture of a syrup of ammonium

hypophosphite resembling a much-prescribed proprietary brand as follows:

1.	Calcium hypophosphite	36.33 Gm.
	Boiling distilled water	400.00 mils
2.	Ammonium sulphate	27.00 Gm.
	Boiling distilled water	50.00 mils

Add 1 to 2 and, while hot, add 7.5 mils diluted sulphuric acid. Let stand over night, filter and add 800 Gm. sugar and water enough to make 1000 mils.—Drug. Circ., 60 (1916), 269. (H. H. S.)

Chocolate Syrup.—*For Soda Fountain Use.*—C. R. Rhodes suggests the following recipe:

Dissolve $2^1/_2$ ounces of gelatin in 10 pints of cold water, heat to the boiling point and add 15 pounds of granulated sugar, stirring until dissolved. Triturate one pound of granulated sugar with one pound of powdered cocoa and with $6^1/_2$ drachms of sodium chloride. Then add the hot syrup, boil for 10 minutes, stirring constantly. Strain while hot and, after cooling, add $2^1/_2$ fluidounces of tincture of vanilla.

In making this syrup, use a 3-gallon tinned iron bucket, with a No. 40 wire strainer attached.—Proc. Penn. Pharm. Assoc.; through Am. J. Pharm., 88 (1916), 580.

Compound Syrup of Cola.—*Preparation of.*—In making this syrup 0.20 gramme of quinine hydrochloride, 0.04 gramme of strychnine nitrate and 0.20 gramme of citric acid are dissolved in sufficient distilled water to make the product weigh 10 grammes. Then add syrup 150.0 grammes, solution of sodium glycerophosphate (50:100) 10.0 grammes, fluidextract of cola 10.0 grammes, and saccharated oxide of iron 15.0 grammes. 4 drops of oil of orange peel are added to each 240 grammes of the mixture, the whole thoroughly shaken and finally filtered.—Pharm. Weekblad; through C. U. C. P. Al. J., 23 (1916), 86. (G. C. D.)

Iodotannic Syrup.—*Preparation of Concentrated Form.*—Boulard, of Chateauneuf-sur-Sarthe, has proved the value of the following concentrated syrup from which the iodotannic syrup of the French Codex can be obtained by diluting one part with nine parts of syrup. The product obtained from the liquor is, he states, identical with the official syrup:

Place in a mortar 20 grammes of iodine and 10 grammes of tannic acid and finely powder them, adding next 30 grammes of tannic

acid. Treat this powder with 160 grammes of alcohol (95 per cent.) in small amounts at a time, transferring the solutions to a glass flask of 1 liter capacity. When solution is complete wash the mortar with a little water, and add this also to the contents of the flask. Add then 250 grammes of simple syrup, mix, cork the neck of the flask with a plug of cotton-wool, and expose to light for forty-eight hours, shaking the flask from time to time. The flask is then placed in a water-bath, the cotton plug still in place, and warmed at a temperature below the boiling point of the alcohol for two hours, with frequent agitation to assist the reaction. At the end of this time the liquid will have lost its black color and opacity, and have become red and transparent. Test with starch paper until all the iodine is combined, then remove from the source of heat. The next stage is to distil off most of the alcohol, which is indicated by the combined weight. When 130 grammes of alcohol have been removed allow the contents of the retort to cool, and add sufficient simple syrup to make 1,000 grammes. Finally, filter through paper, and keep in amber bottles.—Chem. and Drug., 88 (1916), 18.

Syrup of Iron Albuminate.—*Preparation.*—For preparing syrup of iron albuminate, which is free from alcohol and forms clear solutions with potassium bromide, quinine salts and arsenic, Lassen offers the following process: One hundred grammes of dry egg albumin and 420 grammes of soluble iron saccharate (10 per cent.) are allowed to macerate with 980 grammes of water for 24 hours. The mixture is strained and mixed with 900 grammes of syrup and 100 grammes of compound syrup of orange. In a similar manner iron albuminate solution may be prepared. Ten grammes of dry egg albumin and 40 grammes of soluble saccharated iron (10 per cent.) are allowed to macerate for 24 hours with 100 grammes of water, the mixture is filtered and to the filtrate 620 grammes of distilled water, 120 grammes of alcohol, 100 grammes of syrup, 8 grammes of tincture of orange peel and 2 grammes of tincture of vanilla are added.—Apoth. Ztg.; through Drug. Circ., 60 (1916), 146.

Syrup of Ferrous Iodide.—*Preparation.*—William G. Toplis, at a recent meeting of the Pennsylvania Pharmaceutical Association, presented a process for making syrup of ferrous iodide in a hurry. He suggests the use of reduced iron in place of the fine wire as directed in the Pharmacopœia and to modify the manipulation as follows:

Introduce all the iodine and water at once into a flask and then add the iron slowly under constant agitation. In a few minutes all the iodine will be combined. Now add the first portion of sugar and the solution is ready for the filter. Complete according to pharmacopœial directions.—Drug. Circ., 60 (1916), 694. (H. H. S.)

Syrup of Senega.—*Improved Recipe.*—Bertha Mueller finds that a beautifully clear and quite stable syrup can be prepared from fluidextract of senega made by her modified process (see page 69) as follows: Dilute 200 mils of fluidextract of senega with 400 mils of water. If the mixture is acid, neutralize with potassium hydroxide solution. Macerate from 6 to 12 hours, mix with 15 grammes of purified talc, filter and in the filtrate dissolve 850 grammes of sugar by cold percolation.—Am. J. Pharm., 88 (1916), 243.

Syrup of Tea.—*For the Preparation of Iced Tea.*—At the meeting of the Pennsylvania Pharmaceutical Association, C. H. and M. R. LaWall suggested the following recipe:

Percolate 1 avoirdupois pound of tea siftings with boiling water until 64 fluidounces are obtained. Place $7^1/_4$ avoirdupois pounds of sugar in a gallon bottle and pour on enough of the tea infusion to make 1 gallon. Dissolve the sugar by agitation.

To make iced tea, place 2 ounces of the syrup in a tall glass, add ice and water and slice of freshly cut lemon.

It is possible to make a syrup containing the tea and the lemon but these are apt to become cloudy on standing.—Am. Drug., 64 (1916), 316.

TABLETTÆ.

Compressed Tablets.—*Introduction in France.*—M. François presents an interesting paper, protesting against the introduction of compressed tablets in France, where, he says, they were almost unknown to pharmacists until the beginning of the war. He objects to them upon commercial and from scientific grounds, stating that the dispensing of a tablet of antipyrine containing diluents and excipients is as objectionable to pharmacy as would be to the food administration the sale of butter made more firm by the addition of 20 per cent. of paraffin.—J. pharm. chim., 13 (1916), 314.

Compressed Tablets.—*Their Advantages and Disadvantages.*—R. Voiry discusses the foregoing paper of M. François and exhibits far more friendliness to the compressed tablet than does the latter

writer. Voiry challenges the statement that 20 per cent. of diluent is necessary in making tablets and emphasizes the fact that this is the age of mechanical industry and that if the public finds tablets a convenient form of medication, it behooves the pharmacists to supply the demand. Both papers exhibited an amusing ignorance of tablets. François states that they were introduced in 1872 by a German named Rosenthal, while Voiry expresses the hope that "the ingenuity of our mechanics will furnish little machines for pharmacists who will then be able to compress himself such tablets as are demanded of him."—J. pharm. chim., 14 (1916), 177.

Extemporaneous Tablet Making.—*Results of a Study Undertaken to Determine to What Extent Dry Processes of Tablet Making Are Practical.*—The principle objection to extemporaneous tablet making is the drying that is necessary, either of the granulated material or of the moulded triturates. Experiments made by Bernard Fantus and Clyde N. Snow show that many substances can be compressed without using moisture in the preliminary treatment. Granular chemical substances such as ammonium chloride, potassium bromide, hexamethylamine, etc., require no treatment, as these are usually found in a drug store in the proper condition for granulation. Scales and crystals can be broken in a mortar and sifted through a No. 20 sieve. Flaky substances such as phenacetine require the addition of about 20 per cent. of starch as a disintegrator. Fine powders usually offer the greatest difficulties. Bismuth subnitrate can be compressed if mixed with 25 per cent. of starch and $2^1/_2$ per cent. of shredded cacao butter. The use of fat has suggested the use of the following so-called "fat starch" of which 20 per cent. added to most fine powders will bring them in proper condition for compression:

FAT STARCH.

Liquid petrolatum	25
Starch	75

Mix by trituration.

Cacao powder added to the extent of 10 per cent. lends itself to the same use as the fat starch, whenever the color is not objectionable.

While it is conceded that large quantities of tablets can be purchased far cheaper than they can be made, it is claimed that small numbers can be made quite as readily as the same number of pills or powders.—J. Am. Pharm. Assoc., 5 (1916), 147. (L. S.)

Tablets of Corrosive Mercuric Chloride.—*Assay of.*—Walter suggests the following method of evaluation of these tablets: Each tablet should weigh not less than 0.95 or more than 1.05 grammes; the mercuric chloride content should be not less than 48 or more than 51 per cent. The assay of the German Pharmacopœia gives 2 per cent. lower results than the Sass method ("Pharm. Ztg.," 1887, 740) and the latter is not applicable when the tablet contains less than 20 per cent. $HgCl_2$. Walter recommends the preparation of an aqueous solution of the tablets (10 in enough water to make 100 mils) and of a solution of 5 grammes of potassium iodide in enough water to make 100 mils. Titrate 40 mils of the iodide solution with the solution of the tablets until the precipitated mercuric iodide no longer dissolves. Each 16.1 mils of the solution of the tablets represents 5 grammes $HgCl_2$.—Pharm. Ztg., 61 (1916), 298; through Chem. Abstracts (1917).

Tablets of Mercuric Chloride.—*A Safe Form.*—L. S. Levy describes a tablet of mercuric chloride devised by him which is of peculiar size and shape, which prevents casual swallowing and which is flavored with one per cent. of pungent oils, such as mustard or capsicum and of such objectionable taste that no one could eat one by mistake. The illustration shows the exact size and shape of the Levy tablet, which is of the same color and bichloride strength as are the official "Toxitabella."—J. Am. Pharm. Assoc., 5 (1916), 1229.

Fig. 20.

Safe Bichloride Tablet.

TINCTURÆ.

Tinctures.—*Relation of Density, Alcohol and Extract Content of.*—H. Palme attempts to express the relation between the three factors given above by means of the formula $b = a - akt$, a representing the density of the alcoholic extract of the water-free drug, b the density of the alcohol used, t the per cent. of extract, and k a constant determined for each drug. From this formula the percentage of alcohol, either by weight or by volume, may be deduced.—Svensk Farm. Tidskrift, 20 (1916), 373; through Chem. Abstracts (1917).

Tinctures.—*Precipitation in.*—In order to prevent or reduce the formation of precipitates on diluting tinctures with water, Simon recommends the addition of syrup or preferably glycerin to the water.—Arch. di Farm. Sper.; through Drug. Circ., 60 (1916), 482.

Tincture of Aconite.—*Aconitine Assay Useless.*—C. C. Haskell submitted six samples of tincture of aconite made by six manufacturing houses to biological assay, both by the guinea-pig and the cat methods. The results showed that viewed from the standpoint of the "guinea-pig ratio," the relative physiological strength of the six samples was 1, 1.97, 1.97, 4.54, 7.27 and 7.27. By the cat method it was found that the sixth sample was 10 times more toxic than was the first one. Submitting the first, second, third and sixth samples to the assay of the Pharmacopœia it was found that these contained, respectively, 0.04298, 0.04183, 0.04183 and 0.04093 gramme of aconitine to 100 mils and were thus in close proximity to the U. S. P. standard "0.045 gramme in 100 mils." He therefore concludes that the official aconitine assay is not merely useless but that it is dangerously misleading.—Am. Drug., 64 (1916), 129.

Tincture of Aconite.—*Comparison of Guinea-Pig and Cat Assays.*—Haskell and Thomas conducted a series of experiments on cats and guinea pigs with the view of determining whether the cat is a better test animal than the guinea pig in the physiological assay of tincture of aconite. Seven samples were tested upon both cats and guinea pigs and the conclusions reached were:

(1) In the present state of alleged uncertainty regarding the guinea-pig test, the cat method will prove a valuable means of checking the results secured by the former and further use may prove it to possess decided advantages over the guinea-pig method.

(2) The cat method of Hatcher can be used with good results in the attempt to ascertain the strength of samples of tincture of aconite.

(3) Female cats are more resistant and show greater individual variations to the toxic action of aconite than do male cats.

(4) That absorption of aconite apparently occurs readily from the subcutaneous tissues of guinea pigs.—Am. J. Pharm., 88 (1916), 3. (R. P. F.)

Tincture of Aconite.—*Seasonal Resistance of Guinea Pigs to.*—Charles C. Haskell, after some experiments with both the guinea-pig and cat methods of testing aconite, comes to the following conclusions: First, the guinea-pig method as carried out at the present time is unreliable because it has been shown that season influences in a decided way the resistance of the animals to poisoning by tincture of aconite; second, the cat method of Hatcher for the assay of aconite is worthy of a more extended trial. From the results obtained with this method in testing digitalis it is im-

probable that seasonal influences play much of a rôle in influencing the resistance of the animals.—Am. J. Pharm., 88 (1916), 243. (R. P. F.)

Tincture of Digitalis.—*A New Method of Preparation.*—As he finds all but 5.45 per cent. of the solid extractive of tincture of digitalis to be water-soluble, and this small portion inert, "Abel Scholar" recommends that the tincture be prepared by exhaustion of the drug with cold distilled water and addition of sufficient 90 per cent. alcohol to make the final alcoholic strength from 69 to 70 per cent.—Chem. and Drug., 88 (1916), 870. (K. S. B.)

Compound Tincture of Cardamom.—*Criticism of the Recipe of the British Pharmacopœia.*—According to Hill and Umney, this is one of the preparations of the new Pharmacopœia that is not satisfactory; it hardly appears to be an improvement on that of the 1746 edition of the London Pharmacopœia, where it was first introduced. During the early stages of the preparation of the British Pharmacopœia, 1914, experiments were conducted with a view to decreasing the alcoholic strength of the various tinctures, owing to the high price of alcohol, where such reduction could be made without sacrifice of the medicinal activity. The suggestion was made that in the case of compound tincture of cardamom a reduction to 45 per cent. strength would be quite satisfactory, but the experiments then conducted were upon a preparation made with raisins, and not with glycerin. In the monograph, as finally printed, the alcohol employed is of 45 per cent. strength, and the proportion of glycerin is 1 in 10—that is to say, the final alcoholic strength of the preparation is very little over 40 per cent. That of the Pharmacopœia of 1898 was approximately 56 per cent. strength. The 1914 preparation is further unsatisfactory, in that the essential oils extracted from the cardamom, caraway, and cinnamon by the 45 per cent. alcohol are partially thrown out of solution by the addition of the glycerin. There can be little doubt that the tendency of this preparation to gelatinization is attributable to the substitution of a lower-strength alcohol, plus glycerin, for the higher-strength alcohol formerly employed. The defects of the tincture can be obviated and the preparation improved by decreasing the glycerin and raising the alcoholic strength, and for this purpose it is recommended that a 60 per cent. alcohol and 1 ounce only of glycerin in 20 ounces

be used in place of 45 per cent. alcohol and 1 in 10 of glycerin, as now official.—Brit. and Colon. Pharm.; through Pharm. J., 97 (1916), 505.

Compound Tincture of Cinchona.—That form of cinchona preparation known in Germany as *Mariazeller Magentropfen* may be prepared by the following recipe: Cort. Chinæ regiæ conc. 30.0, Cort. Cinnamom. Cassiæ conc., Rad. Pimpinellæ conc., Cort. Salicis conc., Fruct. Foeniculi cont., Myrrha grosso pulv., Lign. Santali rubr. conc., Rad. Gentianæ conc., Rhiz. Calami conc., Rhiz. Zedoariæ conc., Rhiz Rhei conc. aa 3.5, Spiritus dilutus (60 per cent.) 1500.0. Macerate 8 days and then filter.—Vierteljahrssch. f. prakt. Pharm.; through Pharm. Zentralhalle, 57 (1916), 255.

Tincture of Iodine.—*Inconveniences in War.*—F. Rho criticizes the use of tincture of iodine of the French Codex as a war antiseptic because of the rapid formation of hydriodic acid (15 grammes in 1 liter within 2 months). The addition of iodides obviates this objection. Benzene solutions (9.95 per cent. iodine is possible) are being used. When iodine is employed phenol or bichloride dressings must be avoided. Other war antiseptics are a 5 per cent. alcoholic solution of thymol and a mixture of 100 parts of lysol, 400 parts of ether, and 1000 parts of 60 per cent. alcohol.—Schweiz. Apoth. Ztg., 54 (1916), 203; through Chem. Abstracts (1917).

Tincture of Iodine.—*Preventing Deterioration of.*—E. Gianturco states that the formation of hydriodic acid is promoted by heat but not by light and that its production is prevented by the addition of 5 per cent. of potassium iodide. A still better method of preservation is by adding 1 per cent. of iodic acid, which reacts with any hydriodic acid formed with the production of free iodine and water. The extemporaneous methods of Gaglio and of Roques for making up the tincture are discussed and objections pointed out; also the objections to the use of chloroform or benzene as a solvent in making the tincture.—Annali Med. Naval Colonial; through Chem. Abstracts, 10 (1916), 1691.

Tincture Iodine.—*Substitute for.*—H. Schmerz recommends a 5 per cent. alcoholic tannic acid solution as a substitute for tincture iodine.—Münch. Med. Wochschr.; through Pharm. Weekblad, 53 (1916) 154.

Tincture of Opium.—*Modified Assay of.*—Bohrisch and Kuerschner recommended the following modifications to the assay of the German Pharmacopœia: Evaporate 50 grammes of tincture of opium in a porcelain dish to 15 to 20 grammes, dilute with water (38 grammes) and normal ammonia (2 grammes). Filter into a glass-stoppered bottle and to 32 grammes of filtrate (representing 40 grammes of tincture) add 10 mils of acetic ether and 5 mils of normal ammonia, shake for 10 minutes, then add another 20 mils of acetic ether and agitate moderately. Pour the acetic ether layer on to a smooth 8 Cm. filter after the liquid has run through, pass the aqueous liquid through the filter, finally washing flask and filter with water saturated with acetic ether. Transfer the filter and the morphine crystals contained therein to a 200-mil flask, dissolving the morphine adhering to the original flask in 25 mils of tenth-normal hydrochloric acid and transferring this solution and aqueous washings to the flask containing the filter paper. To the combined morphine solution add 20 mils of ether and 10 drops of iodoeosin solution and titrate with tenth-normal potassium hydroxide.—Apoth. Ztg.; through Chem. Abstracts, 10 (1916), 1251.

Tincture of Strophanthus.—*Incompatible with Water.*—A fact which is not generally known is that the tincture of strophanthus when mixed with an aqueous solution undergoes hydrolysis with the formation of a toxic substance, the identity of which is not clearly established.—Schweiz. Apoth. Ztg.; through Pract. Drug., June 1916, 39.

Tincture of Tropæolum.—*Manufacture of.*—Leclerc states that fresh tropæolum leaves are of value in arresting the loss of hair. He prepares a tincture macerating fresh tropæolum leaves, fresh stinging nettles, fresh box leaves and the flowering tops of wild thyme, of each 100 parts, in 500 parts of 90 per cent. alcohol, for 15 days, followed by straining and expression. The article also discusses the history of the nasturtium, Tropæolum majus.—L'Union Pharm.; through Pharm. J., 97 (1916), 590.

Tincture of Vanilla.— *Vanillin Assay of.*—Dox and Plaisance have found a quick and reliable vanillin precipitant in thiobarbituric acid. They assay vanilla extract by dealcoholizing 25 mils, clarifying with enough lead acetate solution to make 50 mils. The filtrate is straw colored and 40 mils are treated with enough concentrated hydrochloric acid to make 50 mils and to produce

12 per cent. acidity. The precipitated lead chloride is filtered off and to 40 mils of this filtrate, thiobarbituric acid is added. The mixture is allowed to stand over night, when the precipitate is collected on a Gooch crucible, washed with 12 per cent. hydrochloric acid, dried and weighed. There is a constant error of 1.4 Mg. vanillin regardless of the amount of vanillin in the sample and this solubility correction must be used. Vanilla extracts containing caramel cannot be assayed by this method as the fural in the caramel is precipitated by thiobarbituric acid. So the caramel test should be applied to all extracts before trying the assay.—Am. J. Pharm., 88 (1916), 481.

Vanilla Extract.—*Preparation and Aging of.*—Dean and Schlotterbeck report a careful study of vanilla extract made under an industrial fellowship grant of the Flavoring Extract Manufacturers' Association. It embodies a large amount of experimental work and contains a bibliography of 60 titles. It discusses thoroughly the composition of vanilla beans and the various theories as to its aroma and then proceeds to the study of the best method of making an extract. Some of the conclusions of the authors are (*a*) that vanilla beans may be dried at room temperature without material loss of flavor and then extracts prepared from such dried and powdered beans are practically the equal of those made from undried beans; (*b*) that when undried beans are used due consideration must be given to the water content of the beans when preparing the menstruum; (*c*) the flavor of an extract prepared from 60 per cent. alcohol is better than that made from a 50 per cent. alcohol; (*d*) the resins of vanillin act as fixatives rather than as flavors; (*e*) the use of alkalies in facilitating extraction of vanilla beans produces a product having unsatisfactory flavor; (*f*) circulatory displacement of vanilla beans at room temperature for three months or more gives a better extract than does maceration and percolation; (*g*) hot maceration gives an inferior product; (*h*) sugar does not aid in the extraction of vanilla beans and should be added to the alcoholic extract; glycerin does aid extraction, and when employed should be added to the menstruum; (*i*) vanilla extract attacks all common metals except gold and silver; copper is markedly attacked and tin is attacked less than any except gold and silver; the extract therefore should not be kept in contact with any metallic parts except those that are plated with tin, silver or gold; (*j*) aging greatly im-

proves the flavor of vanilla extracts, which, when possible, should be kept a year in unpainted, porous wooden barrels.—J. Ind. Eng. Chem., 8 (1916), 607 and 703.

UNGUENTA.

Salve Preparations Containing Inorganic Colloids.—*Preparation.*—According to D. R. P. 268311 and 229306 it is possible, by incorporating solutions of the salts of dyad platinum and palladium into wool fat or the wool-fat alcohols prepared therefrom by saponification, and adding alkali carbonate or soap solution, to prepare salve preparations containing the colloidal hydroxides or soaps of the above metals. In a similar manner, according to the new patent of Kalle & Co. (D. R. P. 289620), the hydroxides or soaps of ruthenium, iridium, osmium and rhodium may be embodied in ointments. For instance, an amount of $RhCl_3 + H_2O$ corresponding to 1 Gm. rhodium is dissolved, with addition of a little concentrated hydrochloric acid to increase solubility, in the smallest quantity of water and gradually and intimately mixed with 9 Gm. wool fat softened by slight warming. In order to produce the colloidal $Rh(OH)_3$ the mass is next thoroughly triturated with the required amount of concentrated soda solution added in small portions at a time. To complete the reaction the ointment mass, after standing a time, is now washed with water and carefully dried, or dissolved in petroleum ether and precipitated with alcohol. The salve preparation obtained is of orange-yellow color and is taken up as organosol by all wool-fat solvents.

For the preparation of salve bodies containing the colloidal tetroxides of osmium, $Os(OH)_4$, and ruthenium, $Ru(OH)_4$, the tetroxides OsO_4 and RuO_4 may be employed instead of the chlorides because these oxides rubbed in solution with wool fat can be changed by treatment with alcohol into the colloidal hydroxides.—Chem. Ztg.; through Apoth. Ztg., 31 (1916), 79. (J. H. W.)

Ointments.—*The Sanitary Dispensing of.*—E. Fullerton Cook in a paper read before the Pennsylvania Pharmaceutical Association points out that the method in use for many years of dispensing ointments in screw lid jars is not entirely satisfactory, due to the frequent exposure to dirt, dust and air. The new method of dispensing in pure tin collapsible tubes avoids all these defects. He describes in detail the different types of tubes and how to properly close, label and finish them.—Drug. Circ., 60 (1916), 754. (H. H. S.)

War Ointment Bases.—The following recipes have been suggested in Germany to lessen the use of those fats so much needed for other purposes: 1. For eye ointments, lanolin of the German Pharmacopœia. 2. For ointments containing no water, paraffin 1.0 Kgm., liquid paraffin 4.5 Kgm., anhydrous lanolin 0.5 Kgm. 3. For ointments containing some water, liquid paraffin 4.5 Kgm., white wax 40 Gm., paraffin 1.0 Kgm., anhydrous wool fat 0.4 Gm., water 450 Gm. In preparing mercurial ointment, base No. 2 is employed with the addition of 30 Gm. of white wax. The anonymous author recommends the permanent use of these vehicles.

Potassium iodide ointment is prepared as follows: Cerasin 215 Gm., liquid paraffin 643 Gm., potassium iodide 104 Gm., distilled water 78 Gm. As a substitute for lard, anhydrous wool fat 30 Gm., paraffin 250 Gm., liquid paraffin 785 Gm., is suggested and may be used in making potassium iodide, lead, and other similar ointments.—Pharm. Zentralhalle, 57 (1916), 96. (J. H.)

Fat in Synthetic Remedies.—*Pharmacological Function of.*—According to W. Schrauth, the active chemical group of a remedy must have a carrier that is able to push it to the organ where it is to operate, there to deposit it, and after the reaction with the cell contents to give up its active group. Unsaturated fatty acids are well adapted as such carriers, since they are seldom esterified by a physiologically active radical without being split off again by intestinal enzymes. Thus the halogen compounds, *bromipin*, *sabromin* and *iodipin*, are easily absorbed and are finally deposited in the liver as haloid acids. *Sajodin*, the potassium salt of iodobehenic acid, is deposited usually in the marrow and pancreatic glands and is eliminated in the urine as potassium iodide. Willstätter's phosphorites and phosphorates are unsaturated fatty acids combined with phosphorus and oxygen. Arsenic compounds of the unsaturated fatty acids are slow and steady in their action and do not show the disturbing influences of arsenic direct. Phosphorus and arsenic thus combined stimulate growth and increase the number of red blood corpuscles.—Seifenfabr.; through Chem. Abstracts, 10 (1916), 1905.

Ointment Opaque to X-Rays.—E. P. Cumberbatch suggests the following recipe: Beeswax, 125, vaseline, 125, finely powdered rosin, 31, anhydrous lanolin, 62 parts, are melted together on the water-bath in the order named, each ingredient being added after the previous one has completely fused. Then finely powdered

litharge, 745 parts, is incorporated, added in small portions at a time. The mixture is then stirred until cold. A layer of this 1 millimeter thick is quite impervious to X-rays. When freshly prepared the above mass adheres to the hands, but this inconvenience disappears after it has been made for a few days.—Pharm. J., 97 (1916), 413.

Cold Cream.—*Oxygenated.*—The following recipe is suggested for preparing cold cream with sodium perborate (bleaching cold cream):

Solid paraffin	250 grammes
White wax	250 grammes
Expressed oil of almond	1000 grammes
Sodium perborate	10 grammes
Distilled water	380 grammes

Vierteljahrssch. f. prakt. Pharm.; through Drug Circ., 60 (1916), 210.

Ointment of Dithymol Diiodide.—*Preparation of.*—Loustallot found difficulty in making an ointment containing 4 grammes of dithymol diiodide and 40 grammes of petrolatum. This difficulty he obviated, however, by adding a small portion of the petrolatum to the finely powdered dithymol diiodide and after a smooth mixture is obtained by trituration, then adding the rest of the petrolatum until a thick homogeneous cream is obtained.—Giorn. farm. chim.; through Chem. Abstracts, 10 (1916), 2385.

Glycerin Camphor Ice.—This preparation may be made as follows: 120 grammes of wax, 120 grammes of spermaceti and 480 grammes of stearin are melted on a water-bath and to the mass are added 120 grammes of powdered camphor and a solution of 60 grammes of borax in 1,000 grammes of glycerin. As perfume, a mixture of 1 mil each of oil of lavender and oil of lemon is recommended.—Pharm. Post; through Drug. Circ., 60 (1916), 210.

Ointment of Iodine.—*Preparation of.*—Commenting on Fored's article on the effect of age on the iodine content of this ointment (Year Book, 1915, 67), F. J. Perusse raises the question as to whether the lard directed in the pharmacopœial recipe should not be replaced by a base, which will not chemically absorb iodine, such as a mixture of wool fat and petrolatum.—Merck's Report, 25 (1916), 77.

Ointment of Iodine.—*Dispensing.*—At the meeting of the Pennsylvania Pharmaceutical Association, M. H. Shimer suggests the following method of quickly dispensing an iodine ointment of official strength:

"By taking the iodine, potassium iodide and glycerin in the proportions given in the U. S. P., we have a compound glycerite of iodine which I have found to keep perfectly.

"To prepare the iodine ointment, 20 per cent. of the glycerite is taken and incorporated with 80 per cent. of benzoinated lard, resulting in a very smooth and effective ointment of standard strength and free from crystals of iodine sometimes found in preparations hastily prepared."—Meyer Bros. Drug., 37 (1916), 271.

Mercury Cream.—*For Intramuscular Injection.*—The following is the method carried out at Haslar Hospital, as communicated to the Royal Commission on Venereal Diseases by Surgeon G. B. Scott. The main points of an ideal cream are:

(1) The mercury must be in an extremely fine state of subdivision.

(2) The basis should be sufficiently fluid at ordinary temperatures to work freely in the syringe and needles, but viscid enough to suspend the metal.

(3) There should be no abrupt transition on warming from the fairly solid to the liquid state.

FORMULA OF CREAM ISSUED TO THE ROYAL NAVY.

Mercury	20 parts	by weight
Anhydrous lanolin	30 parts	
Chlorbutol	2 parts	

And liquid paraffin up to 100 parts by measure.

This contains one grain of mercury in five minims.

Preparation.—Redistilled mercury is purified by allowing it to flow in a thin stream through a long column of nitric acid. It is then washed in distilled water and filtered through chamois leather. The lanolin is sterilized by heat and filtered. One part of lanolin is placed in the mill and two parts of mercury added gradually as the globules disappear. Trituration is continued until a small portion examined under a microscope shows the mercury to be properly subdivided. This paste is cautiously heated in a porcelain dish with the remainder of the proper proportion of lanolin, being finally diluted to the definite required measure with sterilized paraffin, in which the chlorbutol has been dissolved. It is then

strained through sterile white gauze and poured into bottles of 2 ounces capacity ready for use.—Chem. and Drug., 88 (1916), 973.

Methylene Blue Ointment.—*Preparation.*—The following recipe is said to be satisfactory:

Methylene blue	2 grammes
Distilled water	15 grammes
Anhydrous wool fat	30 grammes
Zinc oxide	12 grammes
Bismuth subnitrate	12 grammes
Petrolatum	12 grammes

Vierteljahrsschr. f. prakt. Pharm.; through Drug. Circ., 60 (1916), 340.

Resorcinol Ointments.—According to Breifeld, an impalpable powder of resorcinol is not necessary in making smooth ointments. He dissolves the resorcinol in enough alcohol to make a syrupy liquid, mixes this with the ointment base and then evaporates the alcohol.—Boll. chim. farm.; through Chem. Abstracts, 10 (1916), 2026.

Zinc Salve.—*Modified Recipe.*—Ambrose Mueller, at the meeting of the Missouri Pharmaceutical Association, proposed the following recipe for ointment of zinc oxide, as a substitute for the present official process:

Take a white petrolatum of rather firm consistency, benzoinate it at moderate heat and, while melted, incorporate in it sifted zinc oxide.—Pract. Drug., April, 1916, 36. (H. J. G.)

Toilet Cream.—E. E. Williams finds that more permanent than true cold cream and almost equally satisfactory is the product suggested originally by Frank Edel, consisting of 12 ounces of glycerin, 3 ounces of hydrous wool fat and 9 ounces of white petrolatum.—Am. Drug., 64 (1916), 489.

Toilet Creams.—*Tried Recipes for.*—H. S. Groat offers the following formulæ as comparatively easy to prepare and yet yielding preparations of pharmaceutical elegance:

Caseine Massage Creams.

Formula I.

Skimmed milk	1750.0 Gm.
Magnesium sulphate	175.0 Gm.
Alum	17.5 Gm.

To each 100 grammes of caseine add

Boric acid	20.0 Gm.
Cacao butter	10.0 Gm.
Carmine	..
Essence of bitter almond each	enough

Heat the skimmed milk to 120° F., add the magnesium sulphate previously dissolved in hot water, and set the combined solution aside for one hour. Heat to 135° F. and add the alum previously dissolved in hot water, and continue heating until the temperature reaches 145° F. Strain through cheese cloth, wash the caseine thoroughly with water, then press dry. Tint while moist with carmine, incorporate the boric acid, then the melted cacao butter and perfume.

Formula II.

Skimmed milk	3850 Gm.
Hydrochloric acid	30 Gm.
Boric acid	30 Gm.
Oil of bitter almonds	3 mils
Oil of rose geranium	2 mils
Expressed oil almonds	15 mils
Solution carmine	enough

Add one gallon of boiling water to the milk and bring the temperature to about 80° F. Mix the hydrochloric acid with a pint of water and add slowly to the milk mixture, stirring to facilitate precipitation. Let stand one hour, then disintegrate thoroughly by stirring, strain and wash until freed from hydrochloric acid. Drain 36 hours, or until it has contracted into a dry hard lump. Reduce to a fine powder, moisten with an ounce of alcohol, incorporate the boric acid, then the expressed oil of almonds, mix thoroughly and add the perfume and color. If not of the proper consistency, add a little water.

Formulæ are also given in the paper for cold creams and toilet lotions; but as there are so many of these published from time to time the reader is referred for these to the original article.—J. Am. Pharm. Assoc., 5 (1916), 150. (L. S.)

VINI.

Wine of Ipecac.—*Alkaloidal Strength.*—Beginning with the statement that a certain public analyst has certified that wine of ipecac should contain at least 0.01 per cent. of total alkaloids, H. R. Jensen shows that the alkaloidal content of this wine depends upon method of assay and upon the amount of tannin in the wine used as the solvent. The same sample, prepared by him, gave the following figures:

	(1) Immediate filtration.	(2) Filtration after 48 hours, *i. e.*, strictly pharmacopœial.	(3) Filtration after 9 days' maceration.
Alkaloids (volumetric)..	0.073%	0.055%	0.053%
Alkaloids (gravimetric).	0.106%	0.066%	0.064%
Observed net loss.....	14.1 %	36.5 %	...

The loss on filtration, after standing, is due to the formation of insoluble tannates of the ipecac alkaloids. The paper closes with a criticism of the British Pharmacopœia assay of ipecac preparations. There is also pointed out the fact that molecular weight of emetine, cephæline and psychotrine are so close to each other that their discrepancies do not add any significant error to the volumetric factor, which Jensen thinks should be placed at 0.24034 Gm. to each mil of tenth-normal acid.—Pharm. J., 96 (1916), 518.

Wine of Pepsin.—*Recipe.*—M. Lester Messinger at a meeting of the Pennsylvania Pharmaceutical Association presented the following formula for preparing wine of pepsin:

Pepsin (scale).....	0.85
Hydrochloric acid.....	0.10
Powdered pumice.....	0.15
Glycerin.....	5.00
Alcohol.....	5.00
Sherry wine.....	35.00
Water enough to make.....	50.00

The acid is mixed with 4.5 mils of water and the pepsin dissolved. Now add the alcohol, glycerin, sherry wine and water, triturate with the pumice and filter.—Drug. Circ., 60 (1916), 754. (H. H. S.)

D—NEW REMEDIES AND TRADE-NAMED PREPARATIONS

NOTE.—The paragraphs in this chapter having journal references in parentheses are taken from the Report of the Committee on New Remedies published in the Proceedings of the New York Pharmaceutical Association 1916, pages 213 to 244.

Antisyphilitic Synthetics.—*Russian Brands of.*—V. V. Ivanov states that experiences with a dihydroxydiaminoarsenobenzene prepared by Audrey and Kucher and named *arsenol*, and another preparation made by Shereshefsky and called *benzarsan*, proved that these preparations are identical with the 606 of Ehrlich.—Russki Vratch, 15 (1916), 1088; through Chem. Abstracts (1917).

Proprietary Lice Destroyers.—N. H. Swellengrebel gives the composition of proprietary articles intended to kill lice as follows: *Texan* is a powder consisting of talc, Peru balsam and essential oils; *Globol* is *p*-dichlor-benzol; *Lausofan* is a mixture of cyclohexanon and cyclohexanol. The author finds a 3 per cent.. solution of creolin and a 30 per cent. solution of anisol in alcohol most active and safe for use as insecticide.—Chem. and Drug., 88 (1916), 705. (K. S. B.)

Acetonal Vaginal-Suppositories contain 5 per cent. of alsol and 5 per cent. of tertiary trichlorbutylsalicylic acid ester, combined with a non-fatty vehicle. (C. U. C. P. Al. J.)

Acetopyrine, Anglopyrine, Asposal and Salaspine are acetylsalicylic acids manufactured by various English firms as substitutes for aspirin, the importation and sale of which has been stopped on account of the war. (Am. Drug.)

Acetylcholin.—H. H. Dale and A. J. Ewins claim to have found still another constituent of ergot, which they name Acetylcholin. It is said that this substance has the property of dilating the smaller blood vessels, but does not affect the uterus. (C. U. C. P. Al. J.)

Acrenine, according to the Gaceta Farmaceutica Espanola, is an anemia remedy consisting of quinine salts with arsenic and vegetable drugs. It is given in daily doses of 20 mils. (Am. Drug.)

Adalin.—*Intoxication with.*—A. Nieuwenhuijse reports a case where, after being unconscious for nearly sixty hours, the effect of taking about 45 grains of adalin, a patient has recovered. The symptoms are described as being very similar to those of veronal poisoning.—Ned. Tijdo. Genees; through Pharm. J., 96 (1916), 327.

Ademone.—See Valerian Substitutes.

Aguttan, a product of the firm of Aethenstadt & Raedalan, is oxychinolin salicylic acid. It is used in the treatment of rheumatism and gouty conditions and is given twice daily in 15 to 20 grain doses for fourteen days. Then the treatment is discontinued for a brief period and again resumed, giving the same dose three times daily. (Am. Drug.)

Aivosan.—Under this name tablets are marketed, which, according to the maker, contain the following named medicinal substances: Aetherospermin (alkaloid obtained from Aetherosperma moschatum), viscum album, natrium formicum, kalium jodatum and acidum lacticum. They are said to be efficient in arterial sclerosis. (C. U. C. P. Al. J.)

Albertol is an artificial resin used like mastic preparations as an application to wounds. (Chem. Zeit.)

Algocratin, a new remedy introduced as a substitute for antipyrine and phenacetine, etc., is heralded (on the package) as a much safer medicament than the antipyrine pyramidon group, which it condemns as being extremely dangerous. Algocratin is vaguely named a member of the "phenylamido xanthines" and is given a very artistic and superintricate formula. An analysis appearing in the "Pharmaceutische Zeitung" states it to be a physical mixture of caffeine, pyramidon and phenacetine. (Am. Drug.)

Alival is iodohydroxypropan, $CH_2I—CHOH—CH_2OH$, an odorless and colorless crystalline powder, easily soluble in water. Melting point, 48–49° C. It is also soluble in alcohol and acetic ether. It is used generally in the form of an injection in the treatment of syphilis. (Am. Drug.)

Algolane, a product of the laboratories of Poulenc Brothers, Paris, is the salicylic acid ester of propyldioxy-isobutyrate dissolved in propyl alcohol. It is used in much the same manner

as methyl salicylate (synthetic wintergreen oil) in the treatment of rheumatic conditions. It is also given internally. (Am. Drug.)

Ambrine.—*The Much-Discussed Wound Wax.*—Barthe de Sanfort claims remarkable results in cases of face burns resulting from the liquid fire used in the war by use of his wound wax, which he says is "a mixture of paraffin and resins, approaching the consistence of sticking plaster." It melts at 48° to 50° and can be heated to 125° without decomposition; hence can be easily sterilized. It is applied to the cleansed wound in a warm condition and holding its heat for a long time facilitates cellular proliferation.—Bull. soc. Médico-chir. milit.; through J. pharm. chim., 14 (1916), 311.

Amocithin is highly recommended as a nerve tonic. It is said to contain all the nutritive constituents of yolk of egg and of milk, in a highly concentrated and readily digestible form. An analysis has shown it to contain 11 per cent. of lecithin, hemoglobin, saccharate of iron, protein bodies, nutritive salts, and phosphates of calcium and potassium. (C. U. C. P. Al. J.)

Anginos tabletten, a throat and mouth antiseptic tablet, is said to contain a polymer of formaldehyde combined with palatable milder antiseptics. Dr. Haas & Co., of Stuttgart, are the originators of this remedy. (Am. Drug.)

Anogon is the mercurous salt of diiodoxybenzenepara-sulphonic acid. It is a yellowish, micro-crystalline powder, representing about 50 per cent. of mercury and 30 per cent. of iodine. Anogon is insoluble in most of the ordinary solvents, is very unstable and must be kept in light-proof containers. It is recommended for use in the treatment of syphilis, being injected intramuscularly in an oil suspension, and is alleged to be particularly well tolerated and not to inflame the tissues in any way. (Am. Drug.)

Antibetin is a new diabetic remedy introduced by Radlauer, a Berlin apothecary. Santonin, the use of which has been advocated of late in the treatment of diabetes, is the main constituent of this remedy. Antibetin is marketed in tablet form, each tablet containing santonin 0.05 Gm. ($^5/_6$ grain), magnesium superoxide 0.2 Gm. (3 grains), and an insoluble proteinate, milk sugar and a fatty substance. (Am. Drug.)

Anti-Frostol is an ointment containing an organic iodine compound. (Drug. Circ.)

Anti-Diarrhœin.—This is the name given to tablets, containing salicylate and tannate of bismuth. (C. U. C. P. Al. J.)

Anti-Influenzol is the name given to tablets, each of which contains 0.5 gramme of acetylsalicylic acid. (C. U. C. P. Al. J.)

Antimonyl-Silver Bromide-Arsenic.—The substance, prepared by Danysz, has been named "102," and is for use in syphilis, in which it has given excellent results. The curative action is equal to that of salvarsan, but contains less arsenic, and the secondary effects are both less powerful and less painful. (Pharm. Era.)

Antiputrol is a product of the house of G. Hell, Germany, a powerful germicide whose constituents are not known. (Am. Drug.)

Antodyne is a product of Poulenc Brothers, Paris firm. Chemically it is phenoxypropandihydroxyl ($C_6H_5O.CH_2.CHOH.CH_2OH$). It is a white crystalline product, soluble in water and alcohol and slightly soluble in benzol and ether. Melting point, 69° C. It is prepared ("Pharm. Weekblad") by the interaction of phenol with epichlorhydrin. Antodyne is recommended as an analgesic and antispasmodic. It is given in 0.3 to 0.5 Gm. (5 to 8 grain) doses. (Am. Drug.)

Aphloin is fluidextract of aphloia toeformis, a plant resembling the tea-plant. The preparation is said to be of value in the treatment of affections of the gall bladder. It is given in doses of 10 minims three times a day, increased to 15 minims four times a day. In severe cases doses of 20 minims each may be administered. In appropriate dosage it may also be used as a prophylactic. (C. U. C. P. Al. J.)

Arkryl is a saponified cresol solution manufactured by the firm of Harker & Co., of London. (Am. Drug.)

Arsenæmin is said to be a solution of arsenic and iron saccharates with pepsin. The arsenic content is 0.0075 per cent. It is used in the treatment of anemic conditions. (Am. Drug.)

Arsenobenzol and Diarsenol.—The Council on Pharmacy and Chemistry reports that it found arsenobenzol substantially identical with salvarsan in composition, and equal to salvarsan in thera-

peutic efficiency. The Council reports that these products have not been admitted to New and Nonofficial Remedies because there is a doubt as to the legality of their sale in the United States. But for this doubt as to their legal status, both products would be entirely eligible to N. N. R.—J. Am. Med. Assoc., 67 (1916), 879. (W. A. P.)

Arsenobenzol.—*Non-Toxicity of.*—Udo J. Wile, Ann Arbor, Mich., reports that during the last six months 612 injections of "arsenobenzol" from the Philadelphia Polyclinic have been administered at the University of Michigan Hospital. Wile concludes that the immediate therapeutic results from the use of arsenobenzol are fully as good as those following the use of salvarsan and that, given with proper precaution, the drug has shown itself fully as little toxic as salvarsan. The conclusions refer to intraspinal medication as well as to intravenous.—J. Am. Med. Assoc., 66 (1916), 1880. (W. A. P.)

Artamin is a name for phenol-cinchoninic acid, which has been put forward as a remedy for rheumatism and gout. (Drug. Circ.)

Atoxikokain, according to Dr. Hans Brun, is *p*-amino-benzoyl-diethyl-amino-ethanol-chloral-hydrate, and is therefore practically identical with novocaine. (C. U. C. P. Al. J.)

Atural is a French preparation intended for use in children's diseases as a milk coagulant. It is given in 1 Gm. (15 grain) doses. (Am. Drug.)

Aurocantan.—Cantharidyl ethylene diamine auro-cyanide. $C_{10}H_{12}O_3NCH_2CH_4$. NH_2. HCN. AuCN + H_2O. It is obtained by the interaction of KAuCN and cantharidylethylene-diamine. It is a white, crystalline powder, very soluble in water and alcohol. Its aqueous solution is neutral to litmus. It contains the equivalent of 39.94 per cent. metallic gold. This compound is used in the treatment of phthisis, being administered intravenously in initial doses of 0.025 gramme, following with 0.050 to 0.075 gramme doses. It is marketed by the Farbwerke Hoechst firm in ampul form. (Am. Drug.)

Autorasoir is a dusting powder marketed in Russia. It consists of barium sulphate 12 parts, starch 46 parts, zinc oxide 40 parts, and saponin 2 parts. (Am. Drug.)

Avtobritt.—See Russian Proprietaries.

Baldrianol.—This is not the misspelled German name of oil of valerian, but is isovaleryl carbamide. It can be prepared by removing the bromine from bromural. White crystals, melting at 193° C. and used as a sedative in 0.5 Gm. doses. (Z. angew. Chem.)

Barzarin, a product of the firm of Beck & Co., is a diabetic remedy consisting of a hydroalcoholic solution of a resinous extract obtained from a rare South American plant. The alcohol content is 7 per cent. It is extensively advertised in German periodicals. (Am. Drug.)

Bipheron is a sleep-producing preparation, each 15 mils of which contain the following: Medinal 0.6 gramme, chloral hydrate 2.0 grammes, caffeine sodium benzoate 0.05 gramme and extract of piscidium 1.50 grammes. (C. U. C. P. Al. J.)

Birkelen, a cosmetic preparation contains inspissated birch juice and starch. (Drug. Circ.)

Bismuth bromgallate is an amorphous yellowish powder resulting from the interaction of bismuth nitrate, bromine and gallic acid. It is recommended an antiseptic dusting powder. (Am. Drug.)

Bismuth subacetate, according to the "Pharmazeutische Post," has the formula $BiOCH_3CO_2$. It is a white, extremely fine powder, is odorless and tasteless, and practically insoluble in water. Professor Frœrichs. of Bonn, recommends it as a dusting powder or in the form of an ointment to prevent chafing in children. It can also be used internally like other bismuth preparations. (Am. Drug).

Bispol is a Russian preparation recommended as a generally useful salve. According to the "Apotheker Zeitung," it consists of:

Subnitrate of bismuth	2 Gm.
Boric acid	4 Gm.
Zinc oxide	4 Gm.
Subgallate of bismuth	2 Gm.
Balsam of Peru	3 Gm.
Lanolin	10 Gm.
Petrolatum	20 Gm.

(Am. Drug.)

Blenotin is a proprietary, advertised as a non-irritating urinary antiseptic. It contains oil of sandalwood, myrrh, camphor hexamethylenetetramine, with small amounts of a fungus extract. It

comes in another form intended for persons with ultrasensitive stomachs, the camphor being replaced with a like amount of benzoic acid. (Am. Drug.)

Boesraug-toe contains equal parts of licorice, Iceland moss, Irish moss, orange peel and ripe poppy heads. (Drug. Circ.)

Bolucarbon.—Tablets contain bolus, benzonaphthol and animal charcoal. (Drug. Circ.)

Bolus Alba Sterilisata is recommended as a cheap substitute for the various antiphlogistins. For veterinary practice Kranch recommends the following: 4 parts of bolus alba and 5 parts of glycerin are thoroughly mixed and then heated at a temperature sufficiently high to destroy micro-organisms. After cooling to about 50° C., the paste is at once applied, and covered with a layer of cotton and bandage. It is claimed that if properly applied and protected the paste will hold its warmth for a considerable period. (C. U. C. P. Al. J.)

Bonal, a new nerve remedy, is an aqueous distillate of valerian root, Bercynica montana and peppermint leaves. It contains as added products the oils of clove, cinnamon and camphor dissolved in alcohol. (Am. Drug.)

Bornyval.—See Valerian Preparations.

Boro-plasm is another variety of cataplasm, containing a large amount of boric acid. It is recommended as "an invaluable antiseptic dressing for wounds, ulcers, etc." (Am. Drug.)

Brassicamin contains extracts of thyme, eucalyptus and brassica. It is said to be efficacious in asthmatic conditions, pertussis and inflammatory conditions of the lungs. (C. U. C. P. Al. J.)

Brom-somnisan, a product of the Tutogen Laboratories, Germany, is alleged to be a specific in insomnia. According to an analysis published in the "Apotheker Zeitung," it is nothing but a mixture of the extracts of coffee and valerian fortified with 5 per cent. of bromides. (Am. Drug.)

Buccawol are gelatin capsules which contain extract of buchu, resin of kava-kava and hexamethylenetetramine. (Drug. Circ.)

Cacoskleral Sirup contains 10 per cent. of calcium salts partly as chloride and partly combined with organic acids. (Drug. Circ.)

Calciglycin, a calcium chloride diglycocoll compound, $CaCl_2$-$(2NH_2CH_2COOH) + 4H_2O$, occurs as colorless prismatic needles, which form neutral solutions and do not possess the disagreeable taste of calcium chloride. The product is not hygroscopic, and can therefore be compressed into stable tablets. Loewy highly recommends calciglycin as a substitute for calcium chloride for internal use.—Ther. d. Gegenw.; through Drug. Circ., 60 (1916), 407.

Calcium-Comprettes contain in each tablet 0.10 gramme of crystalline calcium chloride. Peperhowe claims these tablets are of considerable value in the treatment of night sweats of phthisical patients. (Drug. Circ.)

Caldwell's Syrup Pepsin and Herb Laxative Compound.—According to W. A. Puckner ingestion produced physiologic effects like those produced by phenolphthalein; consequently the product was examined for that substance. Phenolphthalein was absent. A preparation of senna was found, also small quantities of a salicylate, probably sodium salicylate. There were no indications of the presence of pepsin. (Chem. Abstracts.)

Calvicit is the name given a tablet preparation containing calcium salts with an albuminate of iron. They are recommended in the treatment of anemic patients, especially where there is insufficiency of lime salts. Dose, one or two tablets several times daily. (Am. Drug.)

Candiolin.—According to E. Impens, this is a calcium salt of a phosphoric acid ester of a carbohydrate obtained from the interaction of sodium phosphate and glucose under the fermenting influence of brewers' yeast.—Deut. Med. Wochschr., 42 (1916), 697; through Chem. Abstracts (1917).

Capsules Cognet contain eucalyptol, creosote, iodoform and peanut oil. (Drug. Circ.)

Capsules Dartois contain beechwood creosote and cod-liver oil. (Drug. Circ.)

Captol.—See Russian Proprietaries.

Cenolin.—*A Wool-Fat Substitute.*—The following preparations are recommended as substitutes for eucerin and wool fat by Segerstedt:

ANHYDROUS CENOLIN.

Cetyl alcohol	3 to 5 grammes
Petrolatum	90 grammes
Wool fat	10 grammes

CENOLIN.

Anhydrous cenolin	50 grammes
Distilled water	50 grammes

The cetyl alcohol can easily be prepared by saponifying spermaceti with alcoholic caustic potash, and pouring the soap into a large quantity of warm water. In order to facilitate the separation of the cetyl alcohol, calcium chloride may be added to the water. The cetyl alcohol is collected and recrystallized from alcohol—Svensk Farm. Tidskrift; through Drug. Circ., 60 (1916), 86.

Cethtol is said to be a mixture of methyl cinnamate and thymol the latter being present to the amount of about 10 per cent. It is used as a stimulant in various lung diseases. (Am. Drug.)

Chineonal is the diethylbarbiturate of quinine and contains 63.78 per cent. of the latter; it occurs as colorless crystals of intensely bitter taste which melt at 132° and are slightly soluble in water and more readily soluble in alcohol and chloroform. Chineonal is recommended as an antipyretic and sedative. (Chem. Abstracts.)

Chinocol.—Under this name tablets are marketed, each of which contains 0.15 Gm. of quinine sulphoguaiacolate and 0.15 Gm. of fluidextract of piscidia erythrina. These tablets are claimed to be of value in the treatment of tuberculosis. (C. U. C. P. Al. J.)

Chlorazene.—Chlorazene (sodium para-toluene-sulphochloramine) is an active germicide acting much like hypochlorites, but being less irritating. Like the hypochlorites it has the advantage over mercuric chloride, zinc chloride, etc., in that it does not coagulate or precipitate proteins, such as blood serum. Chlorazene is reported to be practically non-toxic.—J. Am. Med. Assoc., 67 (1916), 1021. (W. A. P.)

Chlorazon is an anesthetic volatile liquid of unknown composition produced by Dr. Haas & Co., of Stuttgart. (Am. Drug.)

Chlorival.—This, according to the formula as furnished by the manufacturer, consists of the following: beta-trichlor butyl-alde-

hyde, ether, menthol, wool fat, and olive oil. It is used in the form of an inunction in the treatment of rheumatism, gout, and other kindred diseases. (C. U. C. P. Al. J.)

Chlorkalk bolus is a mixture (1:9) of chlorinated lime and bolus, and is used as a dusting powder in wounds. (Drug. Circ.)

Chlorophenacetin is said to possess definite advantages over phenacetin itself. (Am. Drug.)

Cignolin.—This new remedy, intended as a substitute for chrysarobin, belongs to the group of the anthranols, and is in fact 1-8-dioxy-anthranol. It is a yellow powder, which dissolves easily in fats, alcohol, acetone, and benzene. It is claimed to possess a strong antipsoriatic effect. The best ointment base for use with cignolin is white petrolatum, and the substance should be first rubbed with a little olive oil, in order to make a more homogeneous mixture. The action is much stronger than that of chrysarobin.—Dermatol. Wochschr.; through Pharm. Era, 49 (1916), 193.

Cinol is a body vermin exterminator, which is marketed in the form of reddish yellow translucent sticks. It is presumably an alcoholic solution of cineol, eugenol, fenchon, eucalyptol, terpenes and sesquiterpenes, solidified with sodium oleate and cellulose triacetate. (Chem. Zeit.)

Circloids are gelatin capsules which contain oil of santal, oil of pimenta and oil of cassia. (Drug. Circ.)

Citrophen can easily be identified with potassium bichromate by which a violet color is produced. Other substances, however, must be absent. In the presence of these, T. C. N. Broeksmit recommends the following method: One gramme of the mixture is shaken for several minutes with 3 mils of water, the mixture is filtered, the filtrate made alkaline with three drops of ammonia water, acidified with diluted acetic acid and then stirred with an excess of pure barium carbonate. The mixture is then filtered and to the neutral filtrate one drop of potassium dichromate solution is added when in the presence of citrophen even when together with pyramidon, antipyrine, aspirin, salipyrine, migrainin and phenacetine, a red-brown color is produced. If phenacetine is to be detected in the mixture, the above precipitate is washed with

water and heated with sodium salicylate and sulphuric acid in a boiling water-bath. The odor of salicylic acid ethyl ester will be perceptible, especially on diluting the mixture with water, when phenacetine is present.—Pharm. Weekblad, 53 (1916), 77. (H. E.)

Citrospirin is a physical combination of caffeine citrate with acetylsalicylic acid employed in the treatment of migraine and rheumatic conditions. The ordinary dosage is 0.5 Gm. (8 grains). (Am. Drug.)

Citrospirin compound is a mixture of the above with about 1 per cent. of morphine hydrochloride. It is marketed in tablet form, each tablet containing 0.5 Gm. (7.5 grains) of citrospirin with 0.005 Gm. ($^1/_{12}$ grain) of morphine hydrochloride. (Am. Drug.)

Cleminit consists of zinc oxide, ammoniated mercury, starch and a hydrous ointment base. It is perfumed with oil of lavender. (Drug. Circ.)

Confectant is not a confection, but is the trade name of a preparation similar to creolin, marketed by the firm of Edward Cook & Co., of London, England. (Am. Drug.)

Colloidine is described as a colloidal vegetable iodine compound which does not, in any dosage, produce iodism. It comes in the form of tablets, each representing one-third grain of iodine and one grain of vegetable albumen from gluten. Three tablets are said to be the equivalent of 15 grains of iodides. (Am. Drug.)

Combustine is not the name of a new explosive but that of an innocent salve consisting, according to an analysis by Mannich, of petroleum, starch, basic bismuth nitrate, zinc oxide, an organic aluminum compound, boric acid and Peru balsam. (Am. Drug.)

Componal justifies its own name by exhibiting a formula which states that it is a mixture of trional, luminal, adalin, phenacetine and codeine phosphate. (Am. Drug.)

Copper-Salvarsan is a combination of a copper salt with the salvarsan group. It is used like salvarsan and has exhibited no qualities that would make it in any way superior to 606. (Am. Drug.)

Cremiona, introduced by Arthur Weill, of Strassburg, is "a remedy for red noses." It is marketed in collapsible tubes and is stated to be a combination of aluminum acetate, water and a mineral fat perfumed with oil of citronella. (Am. Drug.)

Creosoform, made by Lambiotte Brothers, Paris, is a combination of formic aldehyde with pure creosote. It is recommended as an iodoform succedaneum. (Am. Drug.)

Cristaux jodes Prool is a solution of sodium sulphate, ammonium iodide, tincture of iodine, tincture of squill and tincture of bryonia. (Drug. Circ.)

Curatif Vaugirad is an elixir prepared from pleurisy root and alcornobeque bark. (Drug. Circ.)

Cusylol is said to be nothing more than copper citrate in admixture with an inert diluent. It is water-soluble and is used in ophthalmic work. (Am. Drug.)

Cyanocuprol.— *Use in Tuberculosis.*—In the August issue of "The Journal of Experimental Medicine," Koga, Otani and Takano report on a new treatment of tuberculosis and leprosy. Koga reports that the treatment of animals inoculated with a preparation of copper and potassium cyanide produces healing changes in tuberculous lesions. He also reports on the treatment of sixty-three cases and thinks that his preparation, which he calls "cyanocuprol," greatly improves or cures pulmonary tuberculosis in the first or second stages and even is beneficial in the third stage. Otani also gives a favorable clinical report of tuberculous cases. Takano treated cases of leprosy with "cyanocuprol" with what appears to be beneficial effects. The Japanese investigators give no clear statement in regard to the composition of the copper-cyanide preparation which they used.—J. Am. Med. Assoc., 67 (1916), 443. (W. A. P.)

Cyrrholysin is a compound of bismuth triiodide and thiosinamine, and is given like thiosinamine (fibrolysin) in doses of one-tenth to one-fifth of a grain. (Am. Drug.)

Cystonephrol is a concentrated fluidextract of diuretic drugs to which there is added an extract of kava kava. It is recommended in the treatment of diseases of the bladder, kidneys and the urinary tract. (Am. Drug.)

Demisch yoghurtogen cocoa contains extract of malt yolk of eggs, carbohydrates and nutritive salts. (Drug. Circ.)

Dermo-therma is a skin dressing and counter-irritant manufactured by a Munich firm. It contains formaldehyde, lactic acid, capsicum and a dialyzed arnica fluidextract. (Am. Drug.)

Desazon is a preparation given to soldiers to purify their drinking water. It consists of one ampul containing 0.2 Gm. 75 per cent. chlorinated lime and another containing 0.35 Gm. ortezone (a combination of hydrogen dioxide with urea). The chlorinated lime in the ampul is sufficient to sterilize 1 liter of water and the ortezone is then added to destroy the remaining chlorine taste and odor. (Z. angew. Chem.)

Detractol is another local anesthetic marketed by Dr. Haas & Co., of Stuttgart, the composition of which as yet remains a mystery. (Am. Drug.)

Diabetifuge contains antipyrine, santonin, magnesium peroxide and sodium bicarbonate. (Drug. Circ.)

Diafor.—This is stated to be urea acetylsalicylate, intended for use in fevers, neuralgia, and rheumatism, and also a calmative. The preparation is given in doses of two tablets (each containing 0.66 Gm.) thrice daily. (Pract. Drug.)

Diarsenol.—*Toxicity of.*—Dr. E. H. Martin reports that, after giving several hundred doses of diarsenol without any bad effects whatever, he had two cases in which nausea, vomiting and symptoms of apparent collapse such as have been previously reported by another writer. He found on investigation that the specimens, which in his hands gave untoward results as well as those previously reported on and two further accidents, were all due to a product bearing the same lot number.—J. Am. Med. Assoc., 66 (1916), 1155. (W. A. P.)

Diatrone is a laxative. Each capsule contains the following: phenolphthalein 0.4 gramme, powdered fennel seed 0.03 gramme, powdered chamomile flowers 0.03 gramme, and powdered peppermint leaves 0.04 gramme. (C. U. C. P. Al. J.)

Difantin is a liquid claimed to contain the active principles of digitalis and strophanthus. (Drug. Circ.)

Digifolin, a "Ciba" preparation, contains all the therapeutically active glucosides of the digitalis leaf (digitoxin, digitalein and gitalin) in their natural proportions. It is permanently active and is used internally, subcutaneously or intravenously. It comes in ampuls as well as in tablet form, each tablet being equal in strength to 1.5 grains of standard leaf. (Am. Drug.)

Digipan, according to the "Apotheker Zeitung," is a glucoside obtained from selected digitalis leaves. It is said to be obtained in a high degree of purity through repeated manipulations with various solvents. Dr. Haas & Co., of Stuttgart, are the introducers of this remedy, which is marketed by them in vials, tablets and ampuls. (Am. Drug.)

Digistrophan, marketed only in tablet form contains, as the name indicates, digitalis and strophanthus derivatives. Each tablet, according to the makers, corresponds "exactly" to $1^1/_2$ grains of digitalis and $^3/_4$ grain of strophanthus "of maximum therapeutic activity." It is indicated as a general cardiac tonic. (Am. Drug.)

Dihydromorphine hydrochloride is put forward as a substitute for morphine hydrochloride, under the claim that it is preferable. (Drug. Circ.)

Dineco, Dinedo, Dinedyo and Dinegon are bacterial preparations from the Poulenc laboratories in Paris. Dine- is indicative of products of this firm only and is prefixed to a host of odd syllables designating the various vaccines such as thypus, gonococcic, staphylococcic, etc. (Am. Drug.)

Dixon's pills consist of podophyllin, jalap, soap and extract of dandelion. (Drug. Circ.)

Doronat Ointment consists of equal parts of thorium X and lanolin. (Drug. Circ.)

Dorosan, a whooping cough remedy, is advertised as representing a solution of "tolerable bromides" in a saccharated aqueous extract of Drosera rotundifolia. (Am. Drug.)

Drosithym Burger is a dialysate prepared from sundew and thyme. (Drug. Circ.)

Dunham's specific for whooping cough has been analyzed in the laboratory of the American Medical Association. Substances such as are usually found in cough and whooping cough remedies, such for example as ammonium chloride, antipyrine, extract of glycyrrhiza, opium derivatives and tartar emetic were absent. The preparation appeared to be a colored and sweetened mucilage. (Chem. Abstracts.)

Dymal is a mixture of the salicylates of didymium, lanthanum and cerium. It is an inodorous, pale rose powder which is insoluble in water. It is prescribed in the form of a powder or pomatum and is recommended principally for the treatment of secondary burns and as an antiseptic and exsiccative. (Chem. Abstracts.)

Dysentin is marketed in the form of tablets, each containing 0.40 Gm. of aluminum acetylotannate, and 0.20 Gm. of bismuth salicylate. The tablets are employed as intestinal astringents. (C. U. C. P. Al. J.)

Ecadol, a veterinary remedy, is said to represent the active principles of styrax with coal tar in an emulsified condition. It is used in the treatment of mange, scabs, etc. (Am. Drug.)

Eksip, a product of the firm of Richartz, of Cologne, is a reddish liquid with a specific gravity of 1.012, and is recommended in the treatment of diabetes mellitus. An analysis published in the "Schweizerische Apotheker Zeitung" states it to contain an extract of an alkaloid-free drug and 1.7 per cent. free hydrochloric acid. (Am. Drug.)

Elbon is cinnamoyl-para-oxyphenylurea, a new antiseptic as well as a slowly acting antipyretic. It is indicated in pneumonia and other affections that involve the respiratory organs. It is well tolerated by the stomach and can be given in 15 grain doses several times daily. (Am. Drug.)

Electrargol Heyden is a colloidal 0.02 per cent. silver solution. (Drug. Circ.)

Elimiton.—Sold as a fat reducer. Caffeine, rhubarb, phenyl salicylate and organically combined iodine were found in 2 specimens. In a third iodine was not found. The iodine probably had been derived from thyroid or bladderwrack. (Chem. Abstracts.)

Embarin is a solution of sodium mercury-salicylo-sulphonate, with 0.5 per cent. of acoin. (Drug. Circ.)

Energeen is a casein preparation containing lime and iron glycerophosphates and is advertised in Europe as a substitute for sanatogen. It is marketed by Doctor Pilgrimm, of Arnheim, Germany. (Am. Drug.)

Enesol.—H. Schmidt states this preparation contains mercuric salicylate and methyl arsonic acid in alkaline solution, the mercury content being about one-half, the arsenic content about twice as much as claimed by the manufacturer.—Pharm. Ztg.; through Chem. Abstracts, 10 (1916), 1402.

Epitheen is a salve recommended in the treatment of slow-healing ulcers and consists of a petrolatum ointment with scarlet-red and Peru balsam. (Am. Drug.)

Ergopan is a preparation containing amino bodies and a number of the active constituents of ergot. (C. U. C. P. Al. J.)

Ervasin, or acetyl-paracresotinate, is a white crystalline powder, fairly soluble in water and possessing a slightly bitter taste. It is practically insoluble in the stomach, remaining intact until acted on in the intestines. It is used in the treatment of muscular rheumatism, both acute and chronic, and in other ailments. The average dose is 0.5 Gm. (8 grains) several times daily. (Am. Drug.)

Ervasin Calcium.—This is merely a combination of the preceding with calcium, and is said to be quicker in action than ervasin, due to its easy solubility in the stomach. The dosage is similar to that of ervasin. (Am. Drug.)

Eschle's Keuchhusten Mixtur contains infusion of belladonna leaves, antipyrine and simple syrup. (Drug. Circ.)

Etelen, first called Trigallacetol, is the triacetylethyl ester of gallic acid, therefore chemically closely related to tannigen. It is a white, perfectly tasteless powder and comes into the market in tubes of 15 tablets of 0.5 Gm. each. It is used as an intestinal astringent in daily doses of 1.5–2 Gm.—Münch. Med. Wochschr.; through Pharm. Ztg., 61 (1916), 23. (J. H. W.)

Ethyl iodide-thiosinamine Heyden is a sterilized 20 per cent. solution of thiosinamine and ethyl iodide. (Drug. Circ.)

Euclotten or **Euclottine,** a product of the Saccharin Corporation, London, England, is advanced as a substitute for coagulen—a continental blood residue preparation used, as the name indicates, as a hemostatic and styptic. (Am. Drug.)

Eucodine is the bromoethylate of codeine. It possesses the same general properties as codeine, but is less toxic and may be administered in larger doses and with greater frequency. (Chem. Abstracts.)

Eucupin is the name given to isoamylhydrocuprein. It is marketed in the form of a solution in oil, in the form of an ointment, and in suppository form. It is claimed to relieve pain and to act as a disinfectant. Eucupin bihydrochloricum may be employed in aqueous solutions. (C. U. C. P. Al. J.)

Eudulsan, a remedy for diabetes introduced by Dr. Eucher, of Niewerle, according to the "Schweizerische Apotheker Zeitung," is composed of lecithin and an aromatic plant extract, with about 30 per cent. inorganic matter, chiefly a magnesium salt. Talc was also identified. It is marketed in tablet form, which accounts for the presence of the magnesium silicate. (Am. Drug.)

Eugeine Prunier are granules which contain iron phosphomannitate. (Drug. Circ.)

Eulanin is a product obtained from anhydrous wool-fat and is recommended as an addition to shaving and toilet soaps to render them smooth and non-irritant without detracting any from their lathering qualities. (Am. Drug.)

Eumenol is the fluidextract of the root of a Chinese plant which is variously termed Tang-kui, Tang-kwa, Shan-ki and Won-wu and which is probably a species of Levisticum (Umbelliferæ). Eumenol is one of the oldest remedies in Chinese materia medica and has been used as an emmenagogue; it is non-toxic and free from abortive effects. (Chem. Abstracts.)

Eupad is a white powder, said to be a mixture of boric acid with pure calcium hypochlorite, used in wound disinfection. (Am. Drug.)

Eusol is a 4 per cent. aqueous solution of eupad. (Am. Drug.)

Euronervin contains lecithin and bromides. (Drug. Circ.)

Feld grau is a fluid containing anisol, formaldehyde, and oils of fennel and anise. It is used as a body vermin exterminator. (Chem. Ztg.)

Fellan is a remedy for frost-bites, containing about 12 per cent. of zinc oxide, 40 per cent. of wool fat, and 48 per cent. of soft soap. (Drug. Circ.)

Ferissol is obtained from cinnamic acid and guaiacol powder; it is readily soluble in water, Ferrissol may be taken internally in 1 Gm. doses once or twice per day; 0.9 to 2.7 mils of a 10 per cent. solution may be used daily for injections. (Chem. Abstracts.)

Ferrivine and Intramine.— *Use in Syphilis.*—L. W. Harrison and C. H. Mills say that ferrivine and intramine cause great pain, lasting sometimes two or three days, and often alarming constitutional symptoms and local abscesses when injected, while neither has any apparent influence upon syphilitic lesions.—Chem. and Drug., 88 (1916), 737. (K. S. B.)

Ferroptin is another addition to the army of iron tonics and contains an assimilable iron compound in combination with lecithin and albumin. (Am. Drug.)

Ferryl is a trade name for iron cacodylate solution. (Drug. Circ.)

Fluinol is a concentrated fluidextract of one of the pines, used extensively in Europe as a cough remedy. It is marketed exclusively by A. Schmidt of Düsseldorf. (Am. Drug.)

Fortossan is a diluted phytine (plant phosphorus), indicated in nervous disorders, malnutrition and wherever phosphorus medication is desired. Sugar of milk is the diluent. It is recommended especially for children. (Am. Drug.)

Fricalit is a hydroalcoholic solution of a salicylic acid ester which has not been generally used in the treatment of rheumatism, gout, etc. (Am. Drug.)

Dr. Fünck's Brust-tee consists of coltsfoot leaves, Irish moss, marshmallow root, licorice and star anise. (Drug. Circ.)

Galalith is a formaldehyde-casein preparation recently introduced by the Galalith Gesellschaft, Frankfort, and is asserted to be useful as a wound antiseptic. For surgical work it is marketed in ampuls labeled "Galalith for tubulization." (Am. Drug.)

Gantesol consists of glycerite of tragacanth with 0.2 per cent. mercuric oxycyanide and 1 per cent. of sodium chloride. It is used as a catheter lubricant. (Am. Drug.)

Gelapol is a proprietary exploited for gout, consisting of capsules containing phenyl-cinchonic acid. (Chem. Ztg.)

Girna is a preparation for gout containing 5 per cent. of alcohol, 37 per cent. of glucose, green coloring matter and a small quantity of bitter principle. Apoth. Ztg., 31 (1916), 230; through Chem. Abstracts (1917).

Glanduitrin-Tonogen contains in each mil. 0.2 Gm. extract of pituitary gland, and 0.0005 Gm. of adrenalin. The preparation is claimed to be useful in the treatment of asthma. (C. U. C. P. Al. J.)

Glycophostal is a compound syrup of the glycerophosphate of calcium, iron, manganese, quinine and sodium, with 1.05 per cent. of extract of nux vomica. It is used in the treatment of nervous diseases. (Drug. Circ.)

Glykopon.—According to A. Stephan, this is a mixture of the total alkaloids of opium as glycerophosphates in sterile 10 per cent. solution. The alkaloidal mixture contains 50 per cent. of morphine and 20 per cent. of secondary alkaloids.—Apoth. Ztg., 31 (1916), 351; through Chem. Abstracts (1917).

Glyphocal consists of the glycerophosphates of calcium, sodium, potassium, magnesium and iron, in addition to pepsin and diastase. (Drug. Circ.)

Glyphocosin is the name for a syrup which contains creosote and codeine. (Drug. Circ.)

Dr. Gordon's remedies for epilepsy consist of two liquids. No. 1 contains an alcoholic-aqueous extract of bitter drugs (centaury, etc.) and 0.5 per cent. of mineral matter, chiefly bromides; No. 2 is fluidextract of valerian containing bromides of potassium and sodium. (Drug. Circ.)

Granugenol was formerly called Knoll's granulating wound oil. It is a mineral oil that is used as a protective dressing. (Chem.-Ztg.)

Hacosan is a yeast preparation which is said to be easily digestible and to have a nutritive value three times greater than that of meat. It is supposed to contain much lecithin. (Drug. Circ.)

Hæmnascein Zilz is prepared from saccharated iron oxide, fluidextract of cola, syrup, water and aromatic substances. With a sufficient amount of Fowler's solution to make one teaspoonful contain one milligramme of arsenous acid, it is marketed under the name "Arsenhæmnasein." (Drug. Circ.)

Hamodil abführ likör contains the extracts of buchu, valerian, cascarilla, gentian and wormwood. (Drug. Circ.)

Hamodil hämorrhoidal zäpfchen contains 3 grammes of extract of witch-hazel; formaldehyde, 2.5 grammes; bismuth subgallate, petrolatum, wool fat and oil of theobroma, enough to make 100 grammes. (Drug. Circ.)

Hamodil pillen contain rhubarb both as a powder and as extract, and also phenolphthalein. (Drug. Circ.)

Hediorite, a crystalline, water-soluble substance melting at 145°, said to be the lactone of alpha-glucoheptonic acid. It is given in daily doses of 20 to 30 grains. (Am. Drug.)

Herniol, a "remedy for acute and chronic kidney affections," is a dark brown alcoholic fluid, of a slightly acid taste, and is stated to be an extract of herniara glabra. It is prepared by Doctor Bauholzer, of Munich. (Am. Drug.)

Hexaiodine is the mono-hydriodide of hexamethylenetetramine; it occurs as a white, inodorous, crystalline powder, m. 170–1°, of slightly saline taste, very soluble in water and almost insoluble in the common organic solvents; it contains 47.4 per cent. of iodine. It is exceedingly well tolerated even in large doses and does not produce iodism; the preparation causes increase in appetite in many cases and is indicated in all cases in which iodides are prescribed. The compound is prepared commercially as a solution and in the form of tablets; it may be administered hypodermically or by mouth. (Chem. Abstracts.)

Hexophan is oxyphenylchinolindicarbonic acid, a new gout remedy prepared by condensation of acetosalicylic acid and isatin by warming in alkaline solution and purifying the product through the sodium salt or methyl ester. It is an ochre-yellow, odorless powder, almost insoluble in water, alcohol and ether, difficultly soluble in warm hydrochloric acid, but readily soluble in sodium hydroxide solution or ammonia water. The yellow solution of 0.1 Gm. hexophan in 7 mils tenth-normal potassium hydroxide when diluted with an equal volume of water is colored blood-red with a drop of 1 per cent. ferric chloride solution or olive-green with a drop of alkaline copper tartrate solution. It is used internally in 1 Gm. doses four times daily, later decreased to three times daily.—Apoth. Ztg., 31 (1916), 15. (J. H. W.)

Hexophan-Sodium is used for the same purpose as hexophan but may be given subcutaneously, intramuscularly or intravenously in 0.5 Gm. doses or less. It is soluble in water in the proportion 1 : 6.—Apoth. Ztg., 31 (1916), 16. (J. H. W.)

Holopon, or ultrafiltrat. meconii, is a clear, light brown liquid, 10 parts corresponding to 1 part opium. It comes into the market also as ampuls, tablets and suppositories.

Ultra-filtration, of which the above is a result, is the filtration of liquids through membranes under pressure. The colloids present in the liquid are thus held back and the filtrate contains practically only crystalloids.—Pharm. Ztg., 61 (1916), 32. (J. H. W.)

Hubertus Ointment consists of ammoniated mercury, olive oil, paraffin ointment and white petrolatum. (Drug. Circ.)

Hypnopanton tablets (Dr. Kneubühler) are said to contain pantopon, veronal sodium, and phenacetine. (Drug. Circ.)

Hyrgarsol, made by Heyden, is a combination of mercuric salicylate with methyl arsenic acid and represents 0.49 per cent. mercury and 0.81 per cent. of arsenic. It is marketed in a sterile solution and is administered hypodermically in the treatment of syphilitic conditions in 2 gramme (30 minims) doses to a total of 15 to 30 injections. (Am. Drug.)

Ichthargan Powder.—Dr. P. G. Unna calls attention to the fact that, although chemical reagents show in this preparation both oxidizing (silver) and reducing (ichtholsulphonic acid) action, due to the selecting action of the cells this apparent paradoxical action does not appear therapeutically. The author highly recom-

mends the compound for the treatment of eczema, syphilitic and other ulcers. In short, the claim is made that it can be used to replace all other healing agents in the form of a dusting powder containing 5 per cent. ichthargan, magnesium carbonate being used as a diluent. Excellent results have been obtained by dusting eczematous sores with the 5 per cent. powder and then applying Burow's solution or boric acid ointment, both of which ordinarily fail when used alone. The following ointment is also recommended: Pulvis Ichthargani (5 per cent.), 5 to 10 Gm.; aqua destillata, 45 to 40 Gm.; unguentum zinci, 50 Gm.—D.-A. Apoth. Ztg., 36 (1916), 158. (J. H.)

Ichthyomenthol Edelman is prepared by dissolving 4 grammes of ordinary soap, 3 grammes of ichthyol, and 5 grammes of tannic acid in 50 grammes of alcohol and 10 grammes of water, filtering and dissolving in the filtrate 2 grammes of camphor, 4 grammes of menthol, 10 grammes of methyl salicylate, and 20 grammes of ether. (Drug. Circ.)

Ichthose is a preparation similar to ichthyol possessing characteristics of the older product even to the point of solubility in water and glycerin. (Am. Drug.)

Ilsopon is a mixture of the hydrochlorides of the opium alkaloids. (Z. angew. Chem.)

Indocol is a preparation of iodine in a solid form for use in dressing wounds. It is made by triturating 10 grammes of iodine dissolved in ether with 300 grammes of sterilized kaolin. It keeps well and is applied direct.—Chem. and Drug., 88 (1916), 56. (K. S. B.)

Intramine is an amino compound of sulphur. It is a pale yellow crystalline body, insoluble in water, but soluble in ether, alcohol, and acetone. It is used as a remedy for syphilis. It is best put up as an emulsion in olive oil in which it is suitable for intramuscular injection. A lecithin-absorption compound can be prepared for intravenous administration. It is much less toxic than salvarsan, and is superior to it in recurrent stages of syphilis, but is inferior to it in primary and generalization stages.—Chem. and Drug., 88 (1916), 66. (K. S. B.)

Iocamfen is a dark reddish brown fluid of glycerin-like consistency, containing camphor, phenol and iodine (10 per cent.) in a perfectly clear solution. It is said to be free from any iodides,

alcohol or any of the usual solvents and is recommended as a substitute for the tincture of iodine. (Am. Drug.)

Iocamfen ointment contains 50 per cent. of iocamfen with a consequent content of 5 per cent. free iodine. It is a remarkably smooth ointment and is alleged to be "practically permanent." The indications for its use are the same as for the official iodine ointment. (Am. Drug.)

Iodargol is an oily suspension of colloidal iodine and silver used as an injection in gonorrhœal infections. (Am. Drug.)

Iodatol is a solution of an organic iodine compound in a fixed oil. It is marketed by the British Drug Houses of London, England, in 10, 20 and 25 per cent. solutions. (Am. Drug.)

Iodeosol is a solution of iodine in an organic oily menstruum and recommended for external applications in any condition where the use of active iodine is indicated. (Am. Drug.)

Iod-Lenicet Powder, a substitute for tincture of iodine, contains 10 per cent. of iodine. (Drug. Circ.)

Iodoin is an ingenious device for the extemporaneous preparation of free iodine. It comes in the form of tablets in two sets, the one containing sodium iodide and nitrite, and the other tartaric acid. These tablets are dissolved together in 10 mils of warm water, forming instantaneously a 5 per cent. solution of free iodine. (Am. Drug.)

Iotriferrin contains 15 per cent. iron, 8 per cent. of iodine and 2 per cent. of phosphorus. It is a reddish powder of metallic taste and a faint odor of iodine. It is insoluble in water and diluted acid and readily soluble in alkaline solutions. It is recommended in anemia and scrofula. (Pract. Drug.)

Isarol, according to its manufacturers, is the ammonium salt of the sulphonated distillate of bituminous shale. It contains 9 to 10 per cent. of sulphur and about 7 per cent. "sulphidic" sulphur. It is antiseptic, reduces swelling and promotes absorption. Like "ichthyol" it is a brownish viscous fluid, miscible with glycerin and possessing the peculiar odor and taste of this group of medicaments. (Am. Drug.)

Jabs-Yoghurt Bonbons contain yoghurt bacteria and phenolphthalein. (Drug. Circ.)

Jellax is an aromatic jelly containing a large proportion of heavy mineral oil. It is recommended as a palatable way of administering Russian oil in the treatment of constipation. (Am. Drug.)

Jugentin, a proprietary for the treatment of dandruff and alopecia, is a suspension of 2.1 grammes each of milk of sulphur, and bismuth subnitrate in a mixture of 30 grammes of glycerin, 185 grammes of water and a small amount of alcohol. (Drug. Circ.)

Juca-Juca is another of the many specialties now exploited in Germany as a body vermin exterminator. The original preparation is a mixture of volatile oils and in addition it is now sold in the form of a soapy cream. (Chem. Ztg.)

Juglanden Ferrouil is dry extract of butternut bark. (Drug. Circ.)

Juvenileau.—This is a preparation intended for external use. Upon analysis it was found to consist of an aqueous solution of lead acetate 5 : 100. (C. U. C. P. Al. J.)

Kalkolan-Sirup and Tablets contain calcium glycerophosphate and extract of kola. (Drug. Circ.)

Kalzan is a remedy in tablet form introduced by Wülfung, of Berlin, as a constructive tonic as well as a galactagogue. It is composed of sodium and calcium lactates agreeably combined. (Am. Drug.)

Kephalalbin is a lecithin albumen preparation said to contain 25 per cent. total phosphates. It is recommended in the treatment of neurotics and neurasthenic persons. (Pract. Drug.)

Kharsivan, made by the firm of Burroughs, Wellcome, of London, England, is a substitute for Ehrlich's salvarsan. (Am. Drug.)

Klondol, made by Ed. Cook & Co., Ltd., of London, England, is a preparation similar to lysol but stated to contain more cresol. It is used as a disinfectant. (Am. Drug.)

Kolaid pastillen consist of extract of kola, citric acid and oil of peppermint. (Drug. Circ.)

Kontraluesin is a new antisyphilitic, introduced by Dr. Richter, consisting of fine dust-like mercury suspended in a solution of

sozoiodoquinine and salicylic acid. This remedy is injected intramuscularly by means of special ampuls containing 0.15 Gm. of mercury and 1 Gm. of the liquid. (Pract. Drug.)

Körsan is the name for tablets which contain the extracts of buckthorn, rhubarb and cascara sagrada, powdered aloes and the chlorides, phosphates, sulphates and tartrates of potassium, sodium, calcium, manganese and iron. The preparation also contains pepsin and milk sugar. (Drug. Circ.)

Kratalgin.—This is the name given to a preparation used in the place of algocratin which is a mixture of caffeine, phenacetine and pyramidon, together with phenylamido-xanthin. The latter, however, does not form one of the constituents of kratalgin. (Pract. Drug.)

Kresol Powder is vermin exterminating powder consisting of trikresol (3 per cent.) talcum, bole Armenia and magnesium oxide. (Chem. Ztg.)

Larosan is caseinate of calcium in the form of a light, whitish powder, easily soluble in milk, and recommended as an addition to cow's milk in preparing modified infant food. (Am. Drug.)

Laryngol.—Stupnicki states that this is an emulsion containing chloretone, camphor, menthol, oil of eucalyptus and oil of pine needles. It is used as an inhalant after warming.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 10 (1916), 2613.

Laudopon is, like pantopon, a mixture of the alkaloids of opium. (Z. angew. Chem.)

Lavonat occurs as a colorless and odorless powder, which consists of sodium perborate and sodium pyrophosphate. (Drug. Circ.)

Lenicet-Bolus is the name given by Dr. George Katz, Berlin, to a preparation which he highly recommends in all ovarian and vaginal disorders. It can be used in the shape of injections or in powder form. (Pract. Drug.)

Leptynol is the name of a solution of lanolin and palladium oxide in liquid paraffin, containing 0.0025 Gm. palladium in 1 mil. It is a dark brown thick liquid, which should be warmed

before using. It is used subcutaneously for obesity. (Pract. Drug.)

Leukasol Powder contains trikresol and ethereal oils. It is used for body vermin. (Chem. Ztg.)

Linimentum Bourget contains 2.5 grammes each of oil of juniper and oil of sage; 5 grammes each of oil of mace and eucalyptol; 15 grammes each of oil of sesame and camphorated oil; 10 grammes of methyl salicylate; 4 grammes of salicylic acid and 86 grammes of alcohol. (Drug. Circ.)

Liposal is a patented article consisting of an oil in which 0.8 per cent. of colloidal mercury is suspended. (Pract. Drug.)

Lotional.—A greaseless ointment described by Dr. Theodore Sachs, of Frankfort, as being a combination of zinc oxide and aluminum acetate forming a paste consisting of zinc oxide and aluminum hydroxide, which can be readily rubbed into the skin. Due to loss of moisture, granulations take place quite rapidly and even addition of various fluids did not prevent this obnoxious result. Other agents may be combined with the paste, xeroform, tar, etc. Acids, of course, must not be used.—D.-A. Apoth. Ztg., 37 (1916), 139. (J. H.)

Luargol.—Dalimier and Lévy-Frankel report most favorably on results obtained with injections of Danysz's arseno-antimony-silver compound "102" or luargol, given in the form of injections. By its means it is found possible to quickly render sufferers from syphilitic lesions fit to return to their ordinary occupations with absolute safety to those with whom they come in contact. Under the influence of injections of "102" syphilitic sores of the gravest kind have healed rapidly. The treatment has been successfully applied to a number of military cases picked for their severity, including enormous phagedenic chancres, ulcerous syphilides, gangrenous sores, ulcerated gummata of the third stage, visceral syphilis, and syphilitic myelitis. The investigation has been limited to the curing of these lesions and rendering the patients fit to return to military or other duties. No attempt has been made to study the effect of the remedy on the course of the disease, and no prognosis is at present attempted. In all, over 150 injections have been given, and not a single secondary reaction has been observed. Even the appetite of patients has been unimpaired. They have taken long railway journeys, or have rid-

den long distances on horseback immediately after treatment, without any ill effects being experienced. In this respect "102" has many advantages over salvarsan or other arsenobenzols. Its solutions, also, are relatively stable, so that one stock solution can be used for the treatment during a day, since it remains absolutely unaltered for several hours. Contra-indications against the use of the remedy appear to be very few. It has been administered to an aortic patient, to two cases showing albumin in the urine, and to a case of myelitis with slight jaundice. In these cases the precaution of giving small doses may be taken, not more than 0.05 Gm. to 0.10 Gm. being given for the initial injection. Luargol has also been successfully used with complete success in five out of eight cases of non-syphilitic psoriasis. A general review of the whole results indicates that "102" is more active, markedly less toxic, and need be given in only half the dose that is necessary with salvarsan. For military use, it is far preferable to any of the arsenobenzol compounds.—Comptes rend.; through Pharm. J., 96 (1916), 423.

Ludwig's Wurmmittel is a compound emulsion of oil of chenopodium. (Drug. Circ.)

Lubanol is stated to be a benzoate of a previously unknown resin isolated from Siam benzoin. It forms colorless crystals insoluble in alcohol. More will be heard later of the medicinal value of this compound. (Am. Drug.)

Lustosargin is the name given to a colloidal preparation of iodide of mercury. It is a feebly opalescent, pale yellow solution, which is readily decomposed upon addition of acids, while it is permanent toward alkalies. It also occurs in the form of a powder, which is amorphous, heavy, and faintly yellow in color. It dissolves freely in water, but only slowly. It must be protected from light, and undue changes in temperature. It is used in certain forms of syphilis, in doses of 1 mil gradually increased to 2 mils, administered two or three times weekly, by injection into the gluteal muscles. (C. U. C. P. Al. J.)

Lycryl, another addition to the liquor cresolis family, is the product of an English firm. (Am. Drug.)

Lytussin is a new cough remedy containing a guaiacol derivative with menthol and camphor. It is a clear, brownish yellow liquid with the characteristic guaiacol color, and is recommended in the treatment of all bronchial affections. (Am. Drug.)

Magnesium Hypochlorite is now used in France as a cheap and powerful disinfectant, that is less caustic than are the other hypochlorites. It is made by treating chlorinated lime with a solution of magnesium sulphate. (Am. J. Pharm.)

Malted Treacle.— *Use as Nutrient for Children.*—The use of a mixture of malt extract and treacle is suggested as a nutrient for children.—Chem. and Drug., 88 (1916), 156. (K. S. B.)

Manarsen is the name given to tablets, each of which contains 0.005 Gm. of manganese glycerophosphate, 0.00016 Gm. of arsenous acid, 0.02 Gm. of extract of gentian and 0.05 Gm. of powdered licorice root. (C. U. C. P. Al. J.)

Margol.—A. Laveran says Margol, also known as "102," a compound of arsenic, antimony and silver, has been found effective in treating syphilis.—Chem. and Drug., 88 (1916), 36. (K. S. B.)

Mechanol is an absorbent pad saturated with anisol and is used for body vermin. (Chem. Ztg.)

Megasan-wundpuder contains 25 per cent. of sodium boroformate (megasan) and 75 per cent. of sterilized talcum. (Drug. Circ.)

Mekonal is another hypnotic, the formula of a Dr. Schmidt, of Bielefeld, and consisting of morphine muriate 0.003 Gm., sodium veronal (diethylbarbiturate) 0.15 Gm., and 0.3 Gm. aspirin, incorporated in a flavored tablet. One or two of these tablets may be given at a dose. (Am. Drug.)

Menosal is described as being chemically menthyl-salicylic-methyl ester, or methyl menthylsalicylate, having the formula $C_{18}H_{26}O_3$. The preparation occurs as an oily, transparent liquid almost free from odor and taste. It is soluble in concentrated alcohol, ether, chloroform, and fatty oils, and has a specific gravity of about 1.03709; it boils at 189° C. at 17 Mm. Menosal is said to pass through the stomach unchanged, the salicyl radical being liberated only in the intestines, thereby avoiding any stomach derangements. It is given as an anti-rheumatic in doses of 3 minims in gelatin capsules, and it may also be employed externally in admixture with a suitable vehicle. (Pract. Drug.)

Menostaticum consists of ergopan and extracts of senega, viburnum and chamomile. It is said to be of service in the treatment of uterine disorders. (C. U. C. P. Al. J.)

Menthalan consists of methyl salicylate, menthol and wax ointment. It is used in the treatment of gout and rheumatism. (Drug. Circ.)

Mercurialized Serum is a solution of mercuric chloride in normal horse serum, diluted with normal saline solution. It is given intravenously or intraspinally in the treatment of syphilis. (Am. J. Pharm.)

Mercury Methylsalicylate.—By the action of sodium methyl salicylate on a mercurous salt a white water-insoluble substance was obtained which was said to be methyl salicylate of mercury. Dr. Reutter suggests that it be further investigated to ascertain its therapeutic properties. (Am. Drug.)

Meta Licresan is a soap solution of xylenols, chiefly metaxylenol. (Drug. Circ.)

Metranodyne is a brownish fluid sold on the Italian market as a dysmenorrhœa specific. It consists of fluidextracts of hydrastis, Indian hemp, viburnum prunifolium, and ergot, the latter as a dialyzed extract. (Am. Drug.)

Mettauer's Laxative Aperient is said to consist of aloes, sodium bicarbonate, compound tincture of lavender and water. (Drug. Circ.)

Migrainin.—T. C. N. Broeksmit found that various samples of migrainin (which is official in the Dutch Pharmacopœia (Supplement I) and which consists of antipyrine, caffeine and citric acid) did not give the iodoform reaction for citric acid. The reaction is carried out by dissolving one gramme of the migrainin in 2 mils of water, dissolving in the liquid 100 milligrammes of barium acetate and allowing the mixture to stand for four days. The precipitate of barium citrate is collected, dissolved in 30 per cent. acetic acid, the solution made alkaline with ammonia and mixed drop by drop with tincture of iodine. Iodoform separates immediately. It is absolutely necessary that the precipitate of barium citrate be free from antipyrine, which can easily be removed by washing with alcohol, as otherwise the iodoform reaction is negative. Five samples of migrainin, three of Dutch and two of

German origin, all showed the presence of the proper amount of citric acid. A mixture consisting of acetic acid, succinic oxide, lactic acid, oxalic acid, tartaric acid, lactose, cane sugar, gum and alcohol, was oxidized with permanganate and the oxidation product was subjected to the above tests. No iodoform was found. Naturally the tincture of iodine should first be examined for the absence of acetone.—Pharm. Weekblad, 53 (1916), 1572.

Mingol tablets contain licorice, sugar, gum arabic, peppermint oil and blue flag root. Mingol bonbons contain terpinol and menthol. (Drug. Circ.)

M. I. S. T. No. 2 Nerve Tonic.—According to Dr. Puckner, the initials mean "Murray's Infallible System Tonic." Brownish black cylindrical masses, weighing about 0.33 Gm. each, each inclosed in a gelatin capsule. Aloes, mercury, powdered glycyrrhiza, powdered althæa, starch, traces of calcium, a phosphorus compound, oil of wintergreen and a little sand were found. Nux vomica, cascara, phenolphthalein, saline purgatives, soap, iodides and zinc phosphide were not found. About 4 per cent. of mercury was present. (Chem. Abstracts.)

Modenol is the name for ampuls which contain mercury salicylate solution and arsenic. (Drug. Circ.)

Modjarebe.—See Russian Proprietaries.

Molyform is a combination of molybdenum with an organic radicle and is prepared after a patented process. It is an extremely fine whitish powder soluble in 10 parts of water, and has a peculiar astringent taste. It is recommended as a powerful antiseptic. (Am. Drug.)

Morison's pills contain resin of jalap, aloes, potassium tartrate, and very probably extract of colocynth. (Drug. Circ.)

Morsanol is a hand disinfectant appearing in Europe and consists of a liquid alkali-free soap containing formalin. (Am. Drug.)

Narcyl Cremy is synthetic ethylnarceine hydrochloride. (Drug. Circ.)

Natryl is a name for a sodium cacodylate solution. (Drug. Circ.)

Nervagin contains the water-soluble constituents of valerian.

Neurinase is a solution of veronal in a liquid containing the active constituents of valerian. It is also marketed in the tablet form. (C. U. C. P. Al. J.)

Neurocardine.—According to Mannich and Schirmer this alleged nerve tonic consists of aqueous extract of kava kava, colored red and preserved with salicylic acid.—Apoth. Ztg.; through Chem. Abstracts, 10 (1916), 1399.

Nicosabin is a mixture of nicotine salicylate with boric acid and menthol and is recommended as a generally useful antiseptic powder. (Am. Drug.)

Nikola is a "bathing compound weight reducer." Analysis gave sodium carbonate 82.25 and water 13.85. Traces of sodium chloride were present. The preparation is evidently a common grade of monohydrated sodium carbonate. (Chem. Abstracts.)

Nilaton is said to contain tincture of iodine, sesame oil, liquid petrolatum, linseed oil, aminobenzoic acid ethyl ester, mucilage of acacia, glycerin and soluble oil. It is put forward for the treatment of wounds. (Drug. Circ.)

Nizine Burroughs is zinc sulphanilate. (Drug. Circ.)

Normalin is the name for tablets containing calcium chloride with a mask for its nauseating taste. (Drug. Circ.)

Norolina is an aromatic syrup containing potassium sulphoguaiacolate and the arsenate and glycerophosphate of sodium. It is an Italian specialty. (Am. Drug.)

Norton's chamomile pills consist of rhubarb, jalap, and extract of chamomile. (Drug. Circ.)

Novocol is sodium guaiacol phosphate, a white water-soluble powder. It is indicated in tuberculosis and other lung affections. (Am. Drug.)

Nucleocithin, advanced as a constructive tonic indicated in the treatment of wasting diseases, is said to contain ferric nucleinate and glycerophosphate extract of cinchona and powdered cacao. (Am. Drug.)

Nuclocithose is a powder of composition practically identical with nucleocithin. (Am. Drug.)

Nulomoline is a thick syrupy substitute for glycerin and appears to be a non-crystallizable sugar product.—Chem. and Drug., 88 (1916), 48. (K. S. B.)

Oleanodyne is an ointment containing aconitine, atropine, morphine and veratrine. (Drug. Circ.)

Oleum ferricum colloidale, Carlson is the name given to a solution containing 5 per cent. of colloidal iron oxide in oleic acid, containing a small quantity of iron oleate. It is furnished in the form of a reddish brown, clear oily liquid, which is miscible in all proportions with cod-liver oil, and other fixed oils, forming clear solutions, which are permanent in nature. The oleic acid used in its manufacture is obtained from expressed oil of almond. The preparation is very useful in the extemporaneous manufacture of an iron-containing cod-liver oil. As the preparation contains a definite quantity of iron, the iron content of oils is readily controlled. (C. U. C. P. Al. J.)

Opon is a French preparation asserted to contain all the active constituents of gum opium with the exception of morphine. The latter is separated entirely. Opon is alleged to exhibit hypnotic as well as antispasmodic properties and leaves no undesirable after-effects. (Am. Drug.)

Organidin is an oily solution of organic iodine introduced by the H. K. Wampole Company, Philadelphia, and recommended as a suitable medium in which to administer iodine orally or otherwise. (Am. Drug.)

Ortizone.—See Desazone.

Oryzanin, a remedy recently introduced for the treatment of beri-beri, is a principle isolated from the outer coatings of rice. It is said to be an active stimulant to nutrition and possesses a greater energizing action than peptone, asparagin and similar bodies. (Am. Drug.)

Oxidasol is a nucleinate of manganese described by A. Japelli. It is said to have a favorable influence on the biological properties of the blood serum, acting in a manner similar to that of the colloidal metals. (Pract. Drug.)

Oxypinene is pinene vapor exposed to ozonized air. It is stated to be antiseptic and bactericidal and is used in pulmonary tuberculosis and dry coughs as well as locally. (Am. Drug.)

Oxyquinotheine is a mixture of quinine salicylate and methyltheobromine. (Drug. Circ.)

Pancrofirm, Dr. Scheermesser, is claimed to be a pancreas-milk-albumin preparation. (Drug. Circ.)

Pan-Valeriamon is prepared from valerian. (Drug. Circ.)

Paralan is the name given by C. Schnabel to a substitute for lard, which it is claimed can be used with success as a vehicle in the manufacture of zinc oxide and potassium iodide ointments. Its composition is as follows: anhydrous wool fat 20 parts, solid paraffin 20 parts, and liquid paraffin 60 parts. The fused mixture is stirred until cold. Slight variations from these quantities will furnish a vehicle of firmer or softer consistence.—C. U. C. P. Al. J., 23 (1916), 87. (G. C. D.)

Paralaudin, introduced by the firm of Knoll & Co., is a morphine derivative of the heroine order. It is given in the same doses as the latter, generally in the form of a syrup. Chemically it is diacetyldihydromorphine and is said to give prompter action than heroine or the diacetylmorphine. (Am. Drug.)

Pectocol is syrup of sodium sulphoguaiacolate. (Drug. Circ.)

Pectosat is a syrup of calcium lactate with creosote. (Drug. Circ.)

Perboral, a substance alleged to be a combination of perboric and paraiodophenolsulphonic acids, comes in tablet form, and is recommended in the treatment of genito-urinary troubles. An analysis appearing in the "Repertoire de Pharmacie," however, states that it contains sodium, alum, perboric acid, traces of tartaric acid, and a small quantity of an organic codeine compound. The content of sodium perborate was estimated as 6.57 per cent. (Am. Drug.)

Perhydrit, or solid peroxide, is prepared by combining perhydrol with urea in molecular proportion. It is claimed to be a stable preparation and to contain 35 per cent. of hydrogen peroxide. It is easily soluble in water. (Am. Drug.)

Perkaglycerol.— *Use as Glycerin Substitute.*—Since the war many substitutes for glycerin have been suggested in Germany. Among them is Neuberg's "perkaglycerol," which is highly recommended by Dinkler and Schaumann ("Pharm. Zeit.," 61 (1916), 503). K.

Lewinsohn, on the other hand, has found it inadequate in pharmaceutical practice.—Pharm. Ztg., 61 (1916), 394; through Chem. Abstracts (1917).

Perolin is a pale yellow, clear liquid forming an aromatic emulsion with water. A preparation resembling it closely was made by François by dissolving 50 Gm. potassium soap (50 per cent. water) in 50 Gm. alcohol, and then adding to this solution 50 Gm. essence of lemon, 5 Gm. essence of bergamot, 25 Gm. essence of spike, 10 Gm. essence of thyme, 30 Gm. essence of verbena citronella, 5 Gm. essence of rosemary and formol 1 Gm. to each 10 Gm. A mixture of 25 mils of this fluid with 500 mils of water is used as a disinfecting spray. (Chem. Abstracts.)

Perrheumal is a lanolin base ointment containing 10 per cent. of salicylate and acetylsalicylate of tertiary trichlorbutylalcohol (chloretone). It is used for rheumatic conditions. (Am. Drug.)

Petrin is the trade name given to a rheumatism tablet introduced by the firm of Petri and Co., Germany. They contain a chestnut extract, acitrin and sodium tartrate. (Am. Drug.)

Phenoltetrachlorphthalein.—This remedy, with its elongated cognomen, is a compound of phenolphthalein and is used for the same purpose as the latter, being administered, however, subcutaneously. (Am. Drug.)

Phosferyl-Fournier is a phorphorus-iron compound prepared from the yolk of eggs. (Drug. Circ.)

Phosphotal is creosote phosphorous acid ester. (Drug. Circ.)

Pilules Coulpier are said to contain lecithin, permanganate and disodium methylarsinate. (Drug. Circ.)

Pine Oil Disinfectant.—The U. S. Public Health Service suggests as a general disinfectant, a fluid made by saponifying pine oil and rosin with sodium hydroxide solution. The product is a clear, thick, reddish brown liquid, of more pleasant odor than the cresol preparations, and which makes a milky emulsion with water. Its phenol coefficient is between 4 and 6. (Am. J. Pharm.)

Pituglenan Silbe contains the active principles of the suprarenal gland and of the hypophysis. (Drug. Circ.)

Plagin is a mixture of powdered anise, precipitated chalk and sodium silico-fluoride. It was exploited as a body vermin exterminator, but as it exhibited markedly irritating action, its sale is prohibited in certain German cities. (Chem. Ztg.)

Plasmon, plasmon powder and plasmon milk powder are essentially identical. Each appears to be a crude milk casein rendered partially soluble by treatment with an alkali. Plasmon powder: H_2O 7.43, ash 9.06, P 1.24, N 12.09, protein (N 6.38) 77.10, Na 2.68, fat 0.38 per cent. and lactose traces. Plasmon milk powder: H_2O 7.43, ash 7.54, P 1.25, N 12.20, protein (N 6.38) 77.87, Na 2.01, fat 0.19 per cent. and lactose traces. (Chem. Abstracts.)

Pneumosan.—The use of pneumosan in the treatment of pulmonary tuberculosis has been investigated by Dr. A. E. A. Carver, Birmingham, with results that warrant him in recommending its more extensive employment. It should, however, be used in conjunction with careful supervision of the patient's home conditions, and not as though it were sufficient alone to restore the diseased person to a normal state.—Lancet; through Chem. and Drug., 88 (1916), 21.

Polygalysat, formerly known as senegalysat, is a dialysate or diffusate of senega root. It is given in doses of 10 to 12 drops every two or three hours, in place of the infusion. (C. U. C. P. Al. J.)

Polyphorine is the name for granules which contain the glycerophosphates of calcium, iron and magnesium. (Drug. Circ.)

Pommade Bourget consists of salicylic acid, oil of turpentine, lard, yellow wax, and solid paraffin. (Drug. Circ.)

Preparation 197 Roche, introduced as an emmenagogue and parturient, is a combination of secornin with amino ergot derivatives. (Am. Drug.)

Proglycerin is a lanolin emulsion. (Drug. Circ.)

Protosil is a dry, granular, dark purple substance readily soluble in water to a brown solution, diluting to a golden yellow. It is an organic silver compound, marketed in $^1/_2$ and 1 ounce bottles.—Chem. and Drug., 88 (1916), 594. (K. S. B.)

Protosot is a palatable creosote mixture intended for use as a tonic antispasmodic in the treatment of phthisis. (Am. Drug.)

Pulvis Fluens Hydrargyri is a solid mercuric "ointment" made by extinguishing mercury with a mixture of oil of turpentine and lycopodium. The resulting powder contains 33 per cent. mercury. (D.-A., Apoth. Ztg.)

Purgofig is a syrup of figs combined with 20 per cent. of extract of senna. (C. U. C. P. Al. J.)

Pusol is a dusting powder prepared from phenol and camphor. (Drug. Circ.)

Pyothene is a disinfectant said to contain sulphonated cresols and is prepared by treating cresol with an equal part of sulphuric acid reinforced by the addition of 25 per cent. of the Nordhausen acid. A solid pyothene in the form of a reddish powder is also manufactured. (Am. Drug.)

Quebrachon is an ointment which contains "quebracho ur-extract." It is used in rheumatism, gout, etc. (Drug. Circ.)

Quebracho ur-extrakt is said to contain 40 per cent. of tannic acid and is used as an addition to baths. (Drug. Circ.)

Quietol is valeryl-oxybutyrein hydrobromide. (Drug. Circ.)

Rami Pastilles, Aschoff, contain aconite, cocaine and codeine. (Drug. Circ.)

Recvalysat is a dialysate of fresh valerian root. (Drug. Circ.)

Regipan tabletten contain 56.88 per cent. of nuclein-albumin, 6.95 per cent. of ash, 0.817 per cent. of phosphoric acid, 6.56 per cent. of iron, and 1.2 per cent. of calcium. (Drug. Circ.)

Rekofortin is a mixture of skim milk and casein with 5 per cent. of ovo-lecithin. (Drug. Circ.)

Renovasculin is a physiological reagent which consists of a sterile 10 per cent. milk sugar solution. (Drug. Circ.)

Resicol is an alcoholic solution of resins, balsam of Peru and chlorine derivatives of ethane. It is said to be of service as a dressing for wounds, cuts, burns and other minor injuries, in place of collodion. It is flexible and non-irritant. (C. U. C. P. Al. J.)

Resoldol is the ethylate of 2,4-dioxybenzoylortho-benzoic acid. It is a whitish, odorless and tasteless crystalline powder melting at 135° C. It is useful in the treatment of diarrhea, 0.5 Gm. (8 grains) being given twice daily to adults. It is marketed in 0.5 Gm. tablets. (Am. Drug.).

Rheumasopin, used as an embrocation in rheumatic conditions, contains a salicylic acid ester incorporated by a special process into a superfatted soft soda soap. (Am. Drug.)

Rheumoliniment is an emulsion which contains camphor, oil of turpentine, borax and extract of horse-chestnut. (Drug. Circ.)

Rhinovalin is a mixture of validol and liquid paraffin. (Drug. Circ.)

Rhodoform is the name given to methylhexamethylenetetramine thiocyanate, which contains 37 per cent. of thiocyanic acid. It is an odorless brown powder, melting with decomposition at 143° C. It is recommended as an antiseptic in stomatology. Boll. chim. Farm.; through Pharm. J., 97 (1916), 593.

Rhomnogyre Leprince is mercuric nucleinate. (Drug. Circ.)

Rongoa salbe contains the extracts of sophora tetraptera, lanolin, white petrolatum, boric acid, rose water and balsam of Peru. (Drug. Circ.)

Rotalin pills contain 5 grammes of a special sort of extract of buchu, 0.5 gramme of Siam benzoin, licorice, etc. (Drug. Circ.)

Rurex contains opium, rhatany, cascarilla and benzo-naphthol. (Drug. Circ.)

Russian Proprietaries.—The following recipes for popular Russian pharmaceutical specialties are given in the "Journal de Pharmacie et Chimie:"

Modjarêne. Ferrous carbonate 15, essence of cubebs 3.73, alum 3.73, powdered ratanhia root 15, Canada balsam 15; mix the first four in a mortar gradually, and mix in the balsam, divide into pills each of 0.3 Gm.

Avtobritt (for shaving). Barium sulphate 12, starch 46, zinc oxide 40, saponin 2; powder and mix.

Captol. Vanilla 1, lactose 5, sugar 10, powdered cola 3, quinine hydrobromide 3, aspirin 6.6, salophen 6. Triturate vanilla with

the sugars, screen through silk, mix in the other substances and divide into 1 Gm. packages.

Maltavene. Mix equal weights of barley flour, malt extract, goat's milk and eggs, add 15 per cent. of sugar and 17 per cent. of baker's yeast.

Salarthin, an embrocation, is claimed to contain 25 per cent. of salicylic acid in the form of easily absorbable esters. (Drug. Circ.)

Salhycol is a new disinfectant prepared from crude tar oil, animal glue and water. It is said to possess a high phenol coefficient. (Am. Drug.)

Santoverm tablets, exploited as a worm preparation, are said to contain a naphthaline derivative. (Drug Circ.)

Saphenol is a solution of cresols or crude creosote oil in rosin soap and is a product very similar to creolin. Its admixture with water, however, produces a darker colored fluid. (Am. Drug.)

Sapofen is a solution of tar oil in resin soap, which when mixed with water turns milky. It is claimed to be a non-poisonous, non-irritating disinfectant. In 3 to 5 per cent. solutions it is said to possess the properties of a deodorizer and disinfectant. It may be described as a clear, dark brown liquid, possessing a tarry odor. Its specific gravity is 1.030 to 1.050. Sapofen mixes readily with equal parts of ether or petroleum benzine, and is miscible with alcohol in any proportion, forming practically clear solutions. Five parts of sapofen mixed with 95 parts of water produces a milky solution possessing a mildly alkaline reaction. It contains about 20 per cent. of coal-tar constituents. (C. U. C. P. Al. J.)

Scaben is an odorless anti-scabietic consisting of a petrolatum solution of an antiseptic (beta-naphthol?). It is marketed by Dr. Haas & Co., Stuttgart. (Am. Drug.)

Secretin Preparations.—At the request of the Council on Pharmacy and Chemistry Prof. A. J. Carlson, of the University of Chicago, has studied the action of secretin when administered by mouth or directly into the intestine and also investigated the secretin content of certain alleged secretin preparations. Carlson and his co-workers, like all previous investigators, found that secretin, when given by mouth or introduced even in enormous doses directly into the intestine, is entirely inactive. Further,

they were unable to demonstrate the presence of secretin in samples of secretogen and another supposed secretin preparation (duodenin) bought on the open market, except that one bottle was found which contained a little secretin. Carlson and his coworkers conclude that there is as yet no reliable evidence that lack of secretin is a primary or important factor in any disease and that, should this be established, secretin therapy, to be effective, must be intravenous. The Council endorsed the work of Professor Carlson.—J. Am. Med. Assoc., 66 (1916), 178 and 208. (W. A. P.)

Septovince.—Trichloracetyl diphenol diiodide, at first called "Iodal" but now re-named "Septovince," is claimed to be a valuable bactericide, which is relatively non-toxic, so that it may be freely used internally or locally. It is, moreover, claimed by V. E. Sorapure to be a specific for acute rheumatism. For this purpose an aqueous solution is prepared by shaking together 1 part of septovince and 7 parts of water and setting aside for six hours, when a dark tarry deposit is formed, leaving a clear brown supernatant liquid. The latter is injected intramuscularly in the gluteal region in doses of 5 mils, or applied locally as a paint. A glycerin solution, prepared in a similar manner, is suitable for external use only. No ill effects have been noted with more than 2,000 injections given to patients whose ages varied from two to 97 years. In cases of acute articular rheumatism with pericarditis and endocarditis the dose of 5 mils is injected daily for five days, then every second day for another ten days. The treatment has also given most encouraging results in the treatment of chronic arthritic conditions. The aqueous injections have also given good results in cases of erysipelas. No harmful effect on the kidneys has been observed. For sepsis, the local application of the glycerin solution is advocated.—Med. Press; through Pharm. J., 97 (1916), 463.

Serbol is a vermin exterminator consisting of a chloroformic solution of anisol. (Chem. Ztg.)

Siccotect consists of zinc oxide, starch, glycerin and water. (Drug. Circ.)

Silk Peptone "Hoechst" is primarily used as a diagnostic for peptolytic ferments for employment in the spheres of investigations in immunity and of bacteriology. It is a homogeneous product as uniform as possible in composition, being controlled

by its optical activity. It is extremely easily soluble in water and is distinguished by its high content of tyrosin. (Pract. Drug.)

Skirol is a bismuth preparation of patented composition which is intended to be used in pyelography in place of collargol. It is non-irritating, opaque to X-rays, and capable of flowing through a fine urethral catheter.—Chem. and Drug., 88 (1916), 37. (K. S. B.)

Solac.—*A Synthetic "Milk."*—F. Goldby reports on a "synthetic" or "vegetable milk" introduced to the London market under the trade name of "Solac." The manufacturers claim that it is free from dirt or disease germs, that it has a food value equal to cow's milk, that it is much lower in price than milk.

Mr. Goldby says it looks like cow's milk, at first it tastes like milk, but the after-taste is "nutty." Specific gravity, percentage of fats and percentage of non-fatty solids indicate a composition very much like milk. The nutritive value can only be determined by careful testing.

The source is not stated, but it is thought to be an emulsion prepared from the soya bean.—Pharm. J., 97 (1916), 214. (Z. M. C.)

Soamin Burroughs is sodium para-aminophenylarsinate. (Drug. Circ.)

Sol Ag is a solution of colloidal silver marketed in ampuls and prepared under the direction of Professor Gutbier, of Stuttgart. It is indicated wherever silver medication is needed. (Am. Drug.)

Sol Hg, Sol Pt, Sol Se are solutions, respectively, of mercury, platinum and selenium in colloidal form. All the Sol preparations are marketed by the Haas firm, of Stuttgart. (Am. Drug.)

Solargyl is a compound of silver oxide with proteoses and their decomposition products. It contains 30 per cent. of silver, is insoluble in organic solvents, but dissolves readily in water, yielding a reddish brown solution which may be sterilized without being decomposed and keeps well. (Pract. Drug.)

Solarson is the mono-ammonium salt of heptin chlorarsinic acid. (Drug. Circ.)

Solutol is a cresol-sodium preparation introduced by Von Heyden, and is used chiefly as a veterinary disinfectant.—Chem. and Drug., 88 (1916), 37. (K. S. B.)

Somakola is the name for tablets which contain kola, coca leaves, tea, etc. (Drug. Circ.)

Somnisan is a fluidextract of valerian low in alcoholic content, which has been prepared by percolation from a drug which is at least two years old. Dose 20 to 30 drops in nervousness and a half to one teaspoonful in insomnia. (Pract. Drug.)

Sonnol, a product of the Schäfer Laboratory, Leipzig, is a tonic food and nutritive containing, according to an analysis published in the "Apotheker Zeitung," 30 parts cacao, 65 parts sugar, with 5 parts of banana and potato starch. (Am. Drug.)

Sosidan or **Sasedan** is a palatable aromatic solution of inorganic bromides rendered tolerable by the addition of a "proper digestant." (Am. Drug.)

Staphylase is a streptococcic serum prepared from beer and wine yeast. (Drug. Circ.)

Strychnol is a combination of phosphorus and strychnine arsenates marketed in ampuls. Ferryl is the cacodylate of iron prepared by the same German firm that markets strychnol. (Am. Drug.)

Succocarnin tablets contain beef extract and albumin. (Drug. Circ.)

Sulfotin is the name given to a syrup containing potassium sulphoguaiacolate. (C. U. C. P. Al. J.)

Supersan.—In the treatment of pneumonia, pleuritis and bronchitis, Berliner obtained favorable results with gluteal injections of a mixture of menthol and eucalyptol, especially if antifebrin and salipyrin were added. This new remedy he called supersan. (Pract. Drug.)

Tannaphthol is a condensation product of benzo-naphthol with an albuminate of tannin and is recommended in the treatment of diarrhea, 0.5 to 1.0 Gm. (8 to 15 grains) being administered several times daily. It can also be used as a dusting powder in the treatment of wounds. (Am. Drug.)

Tannargentan is a combination of tannin with an organic silver compound and represents 3 per cent. silver and 20 per cent. tannin. It is given in 0.5 Gm. (8 grain) doses three times daily in the diarrhea of phthisical patients. (Am. Drug.)

Technau's Eucalyptol-Injection is made by mixing together 10 grammes of menthol, 10 grammes of eucalyptol and 50 grammes of castor oil. It is injected into muscular tissue in doses of 1 mil. (C. U. C. P. Al. J.)

Thicol is potassium guaiacol sulphonate containing 50 per cent. guaiacol. It is also given in lung and catarrhal affections. (Am. Drug.)

Thorium Sodium Citrate.—*Use in Pyelography.*—Dr. J. E. Burns states that a double citrate of thorium and sodium may be obtained in a neutral, perfectly non-irritant solution, which is quite opaque to X-rays. To prepare it, 10 Gm. of thorium nitrate dissolved in distilled water and heated on the water-bath are treated with 30 mils of a 1 : 2 solution of sodium citrate, added slowly with constant agitation. The precipitate at first formed is redissolved in the excess of the alkali citrate solution. The liquid is then exactly neutralized with normal sodium hydroxide solution and the volume is made up to 100 mils, when cold, with more water. After filtration, the clear filtrate, sterilized by boiling, is ready for use. The shadow of the renal pelvis and ureters given under this solution is remarkably clear in delineation. In addition to its great opacity to X-rays, the solution accentuates the shadows of calculi in the urinary tract, when they are not ordinarily seen in X-ray plates. That it is quite non-irritant is shown by subsequent cystoscopic examination. The solution is introduced by gravitation, as by the use of the syringe over-distension of the renal pelvis may result. The toxic dose for man, intravenously, would allow more than ten times the quantity required for a pyelogram to be used, or some hundreds of times more than could be absorbed during the procedure. It has been employed in 125 cases at the Johns Hopkins Hospital without any ill effects being observed. In one instance as much as 600 mils was injected into the bladder, ureters, and renal pelvis of a boy of twelve. Attempts to simplify the solution were not successful. A solution containing only double neutral citrate of sodium and thorium was toxic to animals.—Johns Hopkins Bulletin; through Pharm. J., 97 (1916), 413.

Thrombosin is an hemostatic marketed in ampuls. (Chem. Ztg.)

Thybrosal contains extract of thyme, bromides, potassium sulphoguaiacolate and simple syrup. (Drug. Circ.)

Thymoacetol is the acetol ester of thymotic acid, the latter being prepared from thymol by the same process that salicylic acid is derived from phenol, that is, by treating sodium thymolate with CO_2. The acetol ester is produced by a patented process by the interaction of monochloracetone and sodium thymotinate. Thymoacetol is a white, crystalline powder melting at 75° C. It is scarcely soluble in water, but is soluble in alcohol. Hot fats and oils dissolve it. It is manufactured by Deifenbach, of Bensheim, Germany. It is recommended as a local anesthetic. (Am. Drug.)

Thymolphthalein occurs in colorless needles, melting at 245–246° C.; readily soluble in alcohol and acetone; sparingly dissolved by chloroform or by ether. It dissolves in caustic alkalies with the formation of a blue color; it may therefore serve as an indicator for alkalimetry, for the color is not affected by excess of alkali. In strong sulphuric acid it dissolves with production of a carmine-red color. Thymolphthalein is obtained by heating together for six hours at 115–120° C. 3 parts of thymol, 2.5 parts of zinc chloride and 3 parts of phthalic anhydride. The cold melt is then disintegrated, and the uncombined thymol is removed by means of steam. The crude product is dissolved in caustic soda and the solution poured into dilute hydrochloric acid. The liberated thymolphthalein is precipitated; it is washed with water and crystallized from alcohol. (Pract. Drug.)

Thymosal dusting powder is a veterinary preparation and contains 10 per cent. of salicylic acid and 90 per cent. of megasan. It is used in contagious vaginal catarrh of cows. (Drug. Circ.)

Togal contains acetylsalicylic acid, quinine and magnesium and lithium compounds. Mannich confirms Winckel's analysis, which showed 64.3 per cent. of acetylsalicylic acid, 4.06 per cent. of quinine tannate, 12.6 per cent. of lithium salicylate, 6.6 per cent. of starch, 1.84 per cent. of water and magnesium compounds and bolus.—Apoth. Ztg., 31 (1916), 290; through Chem. Abstracts (1917).

Tolamine is a trade name for para-toluene-sodium sulphochloramide, or chloramine, and is used in treatment of infected wounds.—Chem. and Drug., 88 (1916), 47. (K. S. B.)

Toris Compound.—Recommended for rheumatism. Composed of sugar, sodium salicylate and saltpetre. (Pract. Drug.)

Toxan is a body vermin exterminator consisting of linen or silk bags containing naphthalene, powdered calamus, starch, bole Armenia, a few drops of creosote and vanillin. (Chem. Ztg.)

Toxicardine is a wine prepared from lily of the valley, broomtop and cola. (Drug. Circ.)

Trimethol or trimethyl-methoxy-phenol, is a new bactericide that has been hailed as an epoch-making medicament in the treatment of intestinal putrefaction and kindred ailments. It is given the following chemical formula, $C_6H.(CH_3)_3(OCH_3)OH$. It is insoluble in water and when examined by the Rideal-Walker test it shows a phenol coefficient of 40+. Trimethol is said to be a far more valuable germicide than salol and is recommended in all fermentative bowel conditions. It is marketed in enteric coated capsules and in the form of a syrup, each dose representing $1^1/_4$ grains of trimethol. (Am. Drug.)

Trisanol is another vermin exterminator containing tricresol, anisol, oils of eucalyptus and fennel, extract of insect powder, ether and precipitated sulphur. (Chem. Ztg.)

Trivalin is a combination of caffeine, cocaine and morphine valerates. It is recommended as a powerful sedative and is given in small doses like other morphine salts. (Am. Drug.)

Trivetin contains antipyrine, phenacetine and caffeine-sodium benzoate. (Drug. Circ.)

Trombosin is a new hemostatic placed on the market in 5 mil ampuls. It is a very active zytozyme solution prepared from blood serum and hastens the coagulation of blood by increasing the rapidity of thrombin formation.—Deutsch. Med. Wochschr.; through Pharm. Ztg., 61 (1916), 23. (J. H. W.)

Tuberkinin is a combination of tuberculin and alkaloidal quinine. (Am. Drug.)

Tuberkuprose is a solution of copper formate prepared by Zimmer & Co., and recommended in tubercular skin affections. (Am. Drug.)

Tuberlylin is a diagnostic agent in tuberculosis stated to contain many advantages over old tuberculin. (Am. Drug.)

Tubertoxyl is the name ascribed to a combination of tuberculin and atoxyl. (Am. Drug.)

Tubex is a white spongy mass, smelling of camphor and ethereal oils, that is used as a body vermin exterminator. (Chem. Ztg.)

Tubolytin is a highly concentrated culture of the tubercle bacillus containing a minimum amount of non-specific substances. Its preparation does not involve the use of heat or strong chemicals. The dry residue is 100 times, the ash content 30 times, and the nitrogen 45 times less than that of Tuberculin A. (Am. Drug.)

Tulisan is a German specialty advertised as a specific in asthmatic conditions. It is said to contain adrenalin, eumydrin, alypin nitrate, glycerin and Peru balsam in a sterile diluent. (Am. Drug.)

Tussilyt is a hypnotic which on analysis proved to be simply a mixture of veronal with hydroquinine hydrochloride. (Am. Drug.)

Uba is a vermin exterminator consisting largely of cresol powder. (Chem. Ztg.)

Ultroid is a trade name given to a colloidal suspension of copper, silver and mercury. (Am. Drug.)

Unguentum vanafal Merz contains 20 parts of yellow petrolatum and 30 parts of naftalan. (Drug. Circ.)

Uraseptine consists of urotropin, helmitol, piperazin, lithium benzoate, etc. (Drug. Circ.)

Uretrol is prepared by an Italian chemist after a formula used in a Veronese hospital. It is used as a urethral injection. Sodium dimethylamidoazobenzolomonometasulphonate, 0.50; dibromgallic acid, 10.00; water enough to make 1000.00. (Drug. Circ.)

Uricolysin Jahr is an effervescent salt containing lithium and piperazine. (Drug. Circ.)

Urodonal is a granular effervescent salt containing lysidin, sidonal and formin, and is recommended as a uric acid solvent. (Am. Drug.)

Vaccineurin is an autolysate of bacteria. It is used for the treatment of neuralgia, etc. (Drug. Circ.)

Valamin, manufactured by Neumann & Co., Berlin, is the isovaleric acid ester of amylene hydrate. It is a colorless neutral liquid possessing the characteristic odor and taste of valeric acid. It is recommended as a sedative and hypnotic. In hysteria and neurasthenia 0.25 Gm. (4 grains) is given three or four times a day an hour after meals, and, in insomnia, 0.5 or 1.0 Gm. on retiring. (Am. Drug.)

Valerian Substitutes.—Thomson reviews the synthetic esters of borneol which have been used or proposed as substitutes for the varying substances which make up the active principles of valerian root. *Bornyval* is bornyl isovalerate, a colorless, almost tasteless liquid, with an aromatic odor, and boiling at 254–256°. Its action is sedative and tonic, but it has the disadvantage of being rapidly hydrolyzed in the stomach. An improved form, *neobornyl*, which is bornyl valeryl glycollate, is stable in the acid juices of the stomach. It is a colorless, tasteless liquid, boiling at 284–286°. *Valissane* is a related product, being bornyl alpha-bromisovalerate, made by the action of the anhydride of the acid on borneol. Treatment with alcoholic potash removes all the bromine. *Adamone*, or bornyl dibromcinnamate, is a white micro-crystalline powder, prepared by the action of bromine in the cold on an alcoholic solution of cinnamic acid, sulphuric acid being present as a crystallizer. Some of these products have lately come into very extended use.—Pharm. J.; through Pharm. Era, 49 (1916), 69.

Valkasa consists of milk casein and glycerophosphates. (Drug. Circ.)

Vanadarsin, as indicated by the name, is a solution of vanadium and arsenic salt (1 to 1,000). It is a stable sterile solution and is given orally or by intramuscular injection. It is claimed to possess aphrodisiac properties. (Am. Drug.)

Vanozon-Liquor consists, according to Mannich, of 38 per cent. of sodium chlorate and about 0.06 per cent. of a vanadium salt.—Apoth. Ztg., 31 (1916), 290; through Chem. Abstracts (1917).

Venisan or **Venusan,** a new antiseptic which comes as a reddish powder, is stated to be a combination of iodine, phenol and camphor, the latter constituent predominating. It is recommended in the treatment of various skin diseases, especially where there is a tendency to form slow-healing scabs. (Am. Drug.)

Veranacetin.—This name is now used to designate what was formerly known as veranacetin. It is marketed in the form of tablets and powder which contains sodium diethyl-barbiturate, phenacetine and codeine. (C. U. C. P. Al. J.)

Vergotinine consists of veratrine, strychnine sulphate, ergotinine and glycerin. (Drug. Circ.)

Vernisanum purum is iodophenol camphor. It is used as a disinfectant. (Drug. Circ.)

Veropyrin is a hypnotic that analysis has proved to be no more than a mixture of ethyl morphine (dionine), veronal sodium and kalmopyrin. (Am. Drug.)

Versalvine, a white crystalline powder, indicated in the treatment of colds, etc., is hexamethylenetetramine salicylate. (Am. Drug.)

Vinoferrol contains 0.3 per cent. of iron, 1.3 per cent. of aromatic bitter principles such as those of cardamom, cinchona bark, gentian, galangal, cloves, ginger, orange peel, centaury, Ceylon cinnamon and zedoary, 40 per cent. of sweet wine, sugar and water. It is also marketed with 0.005 per cent. of arsenous acid. (Drug. Circ.)

Vis is a nutritive preparation obtained from yeast. (Drug. Circ.)

Vulnassan consists of animal charcoal, white clay, magnesium sulphate, and dry chlorinated lime. (Drug. Circ.)

Vulnofix is a solution of coniferous resins in benzene. It is used as an application to wounds as are the popular mastic preparations. (Chem. Ztg.)

Wawil is an alcoholic distillate of fresh valerian root. (Drug. Circ.)

Wetol is a remedy said to be efficient in the treatment of minor wounds, cuts, bruises, etc. It contains oil of cloves, oil of eucalyptus, oil of myrrh, oil of turpentine, menthol, thymol, camphor, balsam of Peru, linseed oil and cod-liver oil. (C. U. C. P. Al. J.)

Worner's oil liniment is a murky oil. It probably contains oil of turpentine, menthol, oil of sassafras and liquid paraffin. (Chem. Abstracts.)

Xerase is a dry pulverous preparation of yeast cultures and cane sugar recommended as a local application in leucorrhea. (Am. Drug.)

Xylona is a preparation similar to creolin. (Drug. Circ.)

Yabs is a chocolate confection containing phenolphthalein and yoghurt. (Chem. Ztg.)

Zincmattan.—This preparation has been erroneously called zinc methane. Its composition is as follows: Zinc oxide, 10 Gm.;

bismuth chloride, 10 Gm.; linseed oil, 10 Gm.; solution of calcium hydroxide, 10 Gm.; and mattan, 20 Gm. (C. U. C. P. Al. J.)

Ziratol is an antiseptic and germicide of the "naphthalene series." It is odorless and is said to be high in efficiency and low in toxicity. Iodine is present, but only in slight proportions. (Am. Drug.)

MATERIA MEDICA

A—General Subjects

DRUG PLANT CULTIVATION.

Drug Plant Cultivation.—W. W. Stockberger discusses the present general interest in drug culture and the misguided enthusiasm of the public in the financial possibilities of such an enterprise. He expresses the opinion that the growing of drug plants offers little promise as a side crop for general farmers let alone those who have had no farming experience. On the other hand, he believes that the industrial type of medicinal plant garden is likely to bring returns when undertaken by well-equipped growers, not dependent on the industry for livelihood and having sufficient capital to equip and maintain the enterprise until it is on a paying basis.

The drug plant gardens of colleges are of direct and practical value to students, to the college and to the public at large. Not only is such a garden a stimulus to the student body, but it will in time provide a fund of information of permanent value to the agricultural population of the region.—J. Am. Pharm. Assoc., 5 (1916), 1068.

Drug Cultivation.—*On a Commercial Scale.*—C. W. Ballard points out that while drug growing would be very profitable at the present time, we are totally unprepared to carry on this work. We will eventually be successful if we start with a proper realization of the necessity for exhaustive experimentation and the acquisition of more knowledge of the differences between ideal and commercial conditions of cultivation and marketing. Work of this sort can only be successful when ample financial resources and a practical knowledge of agriculture are coupled with expert botanical, chemical and trade advice. A list of references of service to the drug farmer is appended.—Am. Drug., 64 (1916), 260. (C. W. B.)

Drug Cultivation.—*Future in the United States.*—F. B. Kilmer states that owing to the chaotic conditions at present prevailing and uncertainty as to European production after the war, very few ventures in this field will reach a profitable stage. How soon normal conditions will be reached or an equilibrium established after the present conflict is a matter of conjecture. Many of the successful European growers have found it profitable to do their own manufacturing and thus absorb their own products. Cultivation favors uniformity and increase of active constituents but we must be prepared to pay the price of investigation and experiment to improve quality and increase supply.—Pract. Drug., Sept., 1916, 27.

Botanic Drugs.—*How to Cultivate.*—W. W. Stockberger considers the subject from facts shown by experimentation and work of the Bureau of Plant Industry. The appeal to the lay mind of the possibilities in crude drug cultivation was apparent even before the war and the agitation since has awakened a lively interest. The necessity for drug cultivation arises from the following conditions: Many wild-growing medicinal plants are nearing extermination. Foreign-grown drugs lack uniformity but we are seriously hampered when such foreign sources are closed. Drug culture is a highly specialized business and the ordinary farmer cannot expect to succeed. One must have a thorough knowledge of the wholesale, retail and manufacturing drug trades in addition to intimacy with data of normal and abnormal demands, commercial details of handling, selling and purchasing. This knowledge must be the result of actual experience and cannot be found in books. Much valuable information relative to actual growing conditions may be gained from reports of the investigations of Drs. True and Stockberger, published by the Bureau of Plant Industry, U. S. Dept. of Agriculture.

In order for a drug-growing enterprise to carry itself and return about 10 per cent. on the capital invested, it must yield a net profit of $100–$200 per acre. If the allotted acreage (which should be between 25 and 50 acres) is found not to yield this return, it must be increased or the proposition is a losing one. Nurseries, seed houses, experiment stations and wild plants must be depended upon for planting stock. The cost of this stock and greenhouse space for growing it, varies widely. One acre of planting stock of hydrastis will cost about $1500; while five acres of belladonna will call for an outlay of $2500 to $5000. Working up the acreage from the very start is the safest method but defers profits.

Marketing must be done by one having experience in the drug brokerage field as the novice does not know how or when to sell to best advantage. Reduction of crude drugs to extract form is a branch wherein the grower is in the best possible position to compete with the manufacturer. This field offers a good outlet for excess stock or a market closed by unreasonably low prices. Financing is difficult as capital usually looks with disfavor on new lines of endeavor. The only way to launch an enterprise of this sort is through the patronage of wealthy, patriotic men backing a well-organized company. The difficulties to success can only be surmounted by adequate capital, good commercial organization and an expert knowledge of drug plants. The article also gives advice as to equipment and personnel.—Pharm. Era, 49 (1916), 179. (C. W. B.)

Drug Plant Cultivation.—*Importance in the United States.*—H. W. Youngken discusses the many phases of the drug plant cultivation that must be solved before the undertaking will be a commercial success. Among these he cites climatic and soil conditions, best methods of propagation, increase of strength by proper breeding, and manipulation after harvesting. He believes that large manufacturing pharmaceutical houses are in the best condition to cope with these problems.—Am. J. Pharm., 88 (1916), 171.

Drug Plants.—*Cultivation in the United States.*—L. Wayne Arny in an illustrated article states that popular fiction in addition to economic conditions has brought about serious contemplation of the commercial growing of drug plants in this country. Competition with cheap European labor is impossible and consumers will purchase the article of least cost regardless of home industry. Belladonna culture, although very profitable at present, would not be so after the war. Hydrastis, as it is native, is a more promising crop but information regarding its culture is far from complete. An impartial survey of the drug cultivation field at present does not encourage the investment of capital or labor. The only hope is experimentation with a view to the production of better and more uniform drugs. Belladonna offers a problem in plant breeding or the propagation of desirable individuals so that we may obtain a strain combining high atropine content, maximum herbage and minimum variation. Hybridization has given disappointing results thus far although very little work has been done along these

lines. The result through selection of desirable plants is more promising but few people possess enough judgment or keen enough observation to carry on this work. The plants of most importance at this time from the standpoint of cultural possibilities and commercial probabilities are belladonna, cannabis, digitalis, golden seal, henbane, saffron and stramonium. A greenhouse, good soil, cheap labor and good shipping facilities are all necessary for financial return. The chief principles of those undertaking this work should be: superior quality and not transient gain and an increased production of uniform and standard drugs of a degree of purity and excellence demanded by a vital and exacting science.—Drug. Circ., 88 (1916), 597. (C. W. B.)

Drug Cultivation.—*Progress in the Northwest.*—In an illustrated lecture, at which living plants from the drug garden of the University of Minnesota were shown, E. L. Newcomb described various drug plants successfully grown by him.

The various species of Rheum are easily propagated from seed or by rhizome division and with the exception of R. emodi have proved to be hardy. Recently dried rhizomes of R. rhaponticum are found to have emetic properties. Stems from belladonna plants, the leaves and tops of which were considerably above standard, assayed 0.19 per cent. alkaloids. Hyoscyamus, 1915 crop, assayed up to 0.896 per cent. alkaloids. Basal leaves of the first year's growth, when carefully handled, were nearly 100 per cent. above U. S. P. requirement. The plants are liable to attack by beetles but arsenical insecticides applied early are efficient. Seed of biennial plants treated with concentrated sulphuric acid, germinated uniformly in 7 to 10 days. Stramonium of excellent appearance and above official requirements was produced. Aspidium marginalis and A. filix-mas were satisfactorily grown in slat-covered ground. Boggy waste land in Minnesota is well adapted to cultivation of this plant. Cannabis, while easy of cultivation and growing almost wild, did not yield a drug having satisfactory resin content. Echinacea grows well and is easy of cultivation. Inula is easily grown from seed and is hardy but the roots should be harvested at the end of the third year's growth or they are apt to decay. Physiological assays show that Minnesota-grown digitalis is equal to the best imported, although practically all the drug so tested was from first year's growth, as it is difficult to keep the plants from freezing in winter. Digitalis lanata is the most potent although D. purpurea yields a greater weight of leaves. No

medicinal difference is thus far apparent in the medicinal values of different varieties of D. purpurea. Ricinus, delphinium, capsicum, colocynth and the umbelliferous fruits may be grown from the seeds of commerce. Thyme from seed should be sown in cold frames in early spring. The plants stand Northwestern winters with difficulty. The same is true of sage but excellent quality leaves may be obtained from the first year's growth in both cases. —Pharm. Era, 49 (1916), 182. (C. W. B.)

Drug Plants.—*Cultivation in England.*—E. M. Holmes discussing English-grown drugs gives the following as wanted by the hundredweight, and in some cases by the ton:

Agrimony; archangel; avens; betony wood; broom; buckbean; burdock; greater burnet; celandine; centaury; clivers; comfrey; dandelion; dog mercury; eyebright; equesetum; figwort; fumitory; ground ivy; hemlock; meadowsweet; mountain flox; mugwort; mullein.

Such common weeds as the following although a nuisance to the farmer, figure in the price lists of wholesale herbalists: Chickweed; groundsel; knotgrass; mouse ear; nettles; plaintain; selfheal; shepherd's purse; silverweed, as well as the roots of dandelion and dock roots.

Suggestion is made that they be put in heaps by the farm laborers and arrangement made by the local authorities for their sale, to help compensate for the small wages paid for weeding.

Some of the flowers which are required in the dry state are broom; chamomile; coltsfoot; cowslip; red clover; cornflower; elder; hollyhock; lavender; lily-of-the-valley; lime tree; mallow; marigold; marshmallow; mullein; rose and violet. These should be collected as early as possible before expansion, but when fully formed.

The methods of drying and parts of flowers used are also included.

The principal seeds and fruits largely used, many of which might be cultivated in waste places, are as follows: Angelica; broom; burdock; caraway; celery; colchicum; coriander; dandelion; dill; fennel; foenugreek; fleaseed; hemlock; henbane; linseed; mawseed; mustard; quince and stramonium.

Mention is made of the best varieties and the most suitable soil conditions.

A number of medicinal roots that are salable in considerable quantities, some of which have been indicated in the list of herbs in which the foliage is also used; others worth collecting and drying

are: bistort; bryony black; burnet; calamus; colchicum; couch-grass; dock; elecampane; gladiolus; horseradish; lovage; male fern; polypody; tormentil.

The author emphasizes the fact that many of these plants may be grown in small gardens.—Pharm. J., 96 (1916), 101 and 161. (F. H.)

Medicinal Plant Growing.—*English Instruction in.*—A medicinal plant nursery has been started at Chalfont St. Peter, Buckinghamshire, England, where the students are taught the recognition of medicinal plants, their care, propagation, history, Latin and common names, collection, drying and packing for market.—Chem. and Drug., 88 (1916), 893. (K. S. B.)

Drug Plants.—*Cultivation in Germany.*—An address delivered before the Munich Pharmaceutical Society by Dr. Johann Zornig reviewed past results and future possibilities appertaining to the economic and commercial sides of drug cultivation in Germany.—Pharm. Zentralhalle, 57 (1916), 244. (J. H.)

Drug Plants.—*Cultivation in Holland.*—In connection with an exhibition of medicinal plants in Utrecht at the annual meetings of the Dutch Medical and Pharmaceutical Societies the "Pharmazeutische Weekblad" published a special number on the cultivation of medicinal plants, giving much interesting information. Abstracts from the various articles are given in "Chem. and Drug.," 88 (1916), 911. (K. S. B.)

Golden Seal Gardens.—L. E. Sayre describes a garden at Douglas, Mich., which yields annually over 500 pounds of root, noting that the Kalamazoo River region is well adapted for production of plants with high alkaloidal content. Decaying sawdust is used as a fertilizer and plants are sheltered by a rude roof. Ginseng gardens are located in the same region and cared for in much the same way. Attention is called to the large mint farms (1400 to 2100 acres) located inland from the eastern shore of Lake Michigan.—Drug. Circ., 60 (1916), 601. (C. W. B.)

Old-Time Cultivation of Drug Plants.—William M. Johnson in a paper read before the Kansas Pharmaceutical Association reverts back 60 years in describing the various drugs and preparations in use at that time. People sixty years ago were on an average much more hardy, stronger and larger than they are to-day and the

author attributes this to the outdoor life which they led and their close contact with the soil. He commends the gentle art of gardening, not alone for the mental and physical benefits to be derived, but also for financial reasons and goes on to mention some drugs which could be profitably grown.—Drug. Circ., 60 (1916), 605. (H. H. S.)

BACTERIOLOGY.

Bacteriology.—*Training for Pharmacists.*—The Pharmaceutical Society of Great Britain has adopted a resolution urging training in microbiology for pharmacists.—Chem. and Drug., 88 (1916), 713. (K. S. B.)

Drug Store Laboratory.—*Commercial Value of.*—At the meeting of the California Pharmaceutical Association, Carl Dyna argued that the most profitable side-line for the druggist, is the conducting of examinations of urine, pus and blood as demanded in modern diagnosis. The capital that should be invested in this undertaking is the amount expended in obtaining the education necessary to do the work plus the $250 to $300 needed for the purchase of essential apparatus. This apparatus is needed anyway to test one's pharmaceuticals and chemicals in these days of State drug control so why, queries Mr. Dyna, should this money be tied up for defensive purposes only?

He finds the physician is depending more and more upon the pharmacist for such work and that the public turns to the druggist for such service rather than to the professional analytical chemist.—Am. Drug., 64 (1916), 315.

Biological Products.—*Handling in the Drug Store.*—At the meeting of the Pennsylvania Pharmaceutical Association, R. P. Fischelis discussed the storing of biologicals. Emphasizing the fact that such products are unstable and should be stored in refrigerators, he described the type of refrigerator furnished by manufacturers of biologicals and then explained how certain Philadelphia pharmacists stored such products, in order that they be kept under ideal conditions, that they be accessible and that their "expiration date" be kept in mind. The author points out that the retail pharmacist is the logical distributor of biologicals and that while it is true that their use has to some extent curtailed prescription writing, this loss can be more than offset by handling biologicals in a proper and energetic manner.—J. Am. Pharm. Assoc., 5 (1916), 841.

GENERAL BOTANY.

Vegetable Taxonomy.—Under this title, O. A. Wall publishes a highly interesting paper on the subject of sex theories concerning animals and vegetables in mythology. He shows that most ancient religions were based on sex; that certain primitive peoples all over the world had ideas that they had descended from plants; that trees were usually considered as female in plant folk-lore. He traces the theories as to reproduction of animals from ancient times to the present day. He then discusses the sexuality of plants showing that Herodotus (B. C. 450) described the fertilization of female date flower clusters by shaking among them the male flower clusters and that Nehemiah Grew (1682) described distinctly the functions of stamens and pistils as reproductive organs.—J. Am. Pharm. Assoc., 5 (1916), 954.

GEOGRAPHIC BOTANY.

Medicinal Plants of Australia.—A paper on the medical plants of Australia is given by Sidney Plowman, including many common names and medicinal values of the plants.—Chem. and Drug., 88 (1916), 737. (K. S. B.)

Bush Medicines in British Guiana.—An interesting article by James Rodway points out the objections to the use of the "bush" medicines often advocated. The uselessness of many of the drugs after preservation, due to volatility of active constituents, is shown, as well as the fact that many plants of the same class vary considerably in strength, rendering their action unreliable. A comparison of the activity of some of the commoner plants of the same genus or family is given.—Chem. and Drug., 88 (1916), 54. (K. S. B.)

Caucasian Folk Medicine.—Monschinski describes his trip among the nomadic people inhabiting the litoral regions around the Black Sea. He finds that diseases are treated by herb "doctors" and that the remedies employed are: Erythræa Centaurium, for fevers; Pimpernella saxifraga, as a vulnerary; Senecio erucifolius, as a vulnerary; Polygonum Bistorta, as a resolvent; Arum albospathum, in angina or diphtheria; Arum maculatum, in rheumatism; Agrimonia Eupatoria, as antithermic and resolvent; Althæa officinalis, combined with grease in skin troubles; Buxus sempervirens as anthelmintic; Centaurea Jacea, as emmenagogue; Fœniculum officinale, the leaves a condiment, the root as anthel-

mintic; Rhamnus frangula, as an infusion with milk, for indigestion; Sedum glaucum, combined with butter or mutton suet as a vulnerary. Digitalis ferruginea is used in veterinary medicine, but since its toxic properties are known, it is not used in human medicine.—Pharm. J.; through J. pharm. chim., 13 (1916), 162.

Dutch Medicinal Plants.—With regard to the scarcity of several drugs of foreign origin, Dr. H. Pinkhof and Mr. L. H. van Berk mention several Dutch wild plants that have been neglected of late, but which formerly were credited with medicinal properties. Dr. Pinkhof mentions the root of Symphytum officinale, an old remedy for the treatment of wounds; the seeds of Plantago, which form an excellent laxative; and Erodium cicutarium, the liquid extract of which is largely employed, with success, in Holland at present in the place of hydrastis.

Mr. van Berk collected for the exhibition a number of Dutch medicinal plants, which he arranged according to their pharmacological properties. As laxatives of inland origin, he mentions folia fraxini (in the form of a decoction), the rhizome of Polypodium vulgare, cortex medianus sambuci, radix lapathi acuti (the root of Rumex obtusifolius), and cortex rhamni frangulæ. As expectorants, Mr. van Berk mentions radix saponariæ (Saponaria officinalis), folia farfaræ (Tussilago farfara), and herba et radix euphorbiæ peplus (in a decoction 5 : 1,000) as substitutes for ergot of rye and hydrastis. Mr. van Berk also calls attention to an infusion or a liquid extract of Erodium cicutarium, and to the very common plant Senecio vulgaris, which was first recommended by the late Dr. W. Murell, of the Westminster Hospital, London, for this purpose. Comparative physiological experiments made by Dr. Storm van Leeuwen with regard to the activity of tinctures of ergot of rye, senecio leaves, senecio root, and erodium plants, all of them made in the proportion of 1 : 5, showed that ergot of rye and erodium are of about equal activity; herba senecionis was more active, and radix senecionis appeared to be the most active of all. The active principle of senecio is nearly insoluble in water. The experiments with these plants are being continued. At the end of his article, Mr. van Berk further calls attention to summitates sarothamni as a substitute for strophanthus and digitalis, and to Polygonum aviculare as a remedy for diabetes.—Chem. and Drug., 88 (1916), 911.

India as a Drug Producer.—An article is published by David Hooper on the important drugs indigenous to, or cultivated in, India.—Chem. and Drug., 88 (1916), 786. (K. S. B.)

Italian Medicinal Plants.—*Habitat.*—The results of a study of Italian medicinal plants are published by Cortese. Tables are given showing the plants common to all Italy (17 species) and those peculiar to certain districts (25 species). The special conditions under which each plant grows are stated.—Chem. and Drug., 88 (1916), 175. (K. S. B.)

Latin-American Tanning Materials.—At the second Pan-American Commercial Congress, T. H. Norton enumerated 143 sources of tanning material available in Latin America. Of these, the stock of quebracho is sufficient to supply all of the needs of the United States, but for the fact that it yields good results only when used with other tanning materials. Among these, Norton mentioned mangrove bark, cascalote, divi-divi, canaigre, Mexican sumach, algarobilla and rhatany, each of which has a higher tannin content than have the oak and hemlock barks of Europe and the United States.—Am. J. Pharm., 88 (1916), 187.

Latin-American Dyestuffs.—At the same meeting, S. P. Sadtler pointed out that prior to Perkin's discovery of mauvein in 1856, most dyes were obtained from the tropics. He described those natural dyestuffs native to Latin-American countries, classifying them according to color, nature and general uses.—Am. J. Pharm., 88 (1916), 188.

Pine Products.—*Progress of Industry in the United States.*—At the same meeting, C. H. Herty described the aid extended the southern pine industry by chemical research. The United States Forest Service has persuaded many operators to replace the wasteful and destructive "box" system of collecting turpentine by the modern "cup and gutter system," thereby not merely saving the life of the tree, but also increasing the yield 25 per cent. Chemistry has also shown that by extraction, technically useful resinous products may be obtained and at the same time the residual wood is made fit to be ground into paper pulp.—Am. J. Pharm., 88 (1916), 191.

DRUG COMMERCE.

Drug Scarcity.—*Conditions Resulting from.*—The report presented at the meeting of the New York State Pharmaceutical Association from the Committee on the Drug Market, which was composed of Joseph Weinstein, H. H. Rusby and Thomas Latham, dealt chiefly with the enormous increase in drug prices due to war conditions and the resultant diminution in quality in many cases. Dr. Rusby pointed out that in the case of crude drugs coming from Europe many of the trained collectors are engaged in warfare and the drugs show the effect of ignorant collecting. Moreover, permissible deviation from standards is extended to the minimum. Mr. Latham cites the common weed, dog-grass, as an illustration of soaring prices. Dr. Weinstein writes of drug speculation that sometimes brought profits; sometimes losses.—Pharm. Era, 49 (1916), 353.

Coöperation to Offset the High Price of Drugs.—R. P. Fischelis in a paper read before the Philadelphia branch of the American Pharmaceutical Association discusses the subject as to why so many drugs should be so scarce and high in price. He suggests that as a remedy the druggist might make suggestions to the prescribing physician which would tend to relieve the situation by pointing out which chemicals and drugs are high in price and difficult to obtain. The writer then takes up the three classes of drugs, namely, the vegetable, the inorganic chemicals and the organic chemicals and describes the market situation in detail.—Drug. Circ., 60 (1916), 332.

Unobtainable Materia Medica.—*Possibilities of Displacing.*—At a joint meeting of the Philadelphia branch of the American Pharmaceutical Association and of the Philadelphia County Medical Association, Dr. S. Solis Cohn contended that the problem of finding a drug that will successfully displace one now obtainable is not as simple as it seems. Tincture of cinchona cannot replace quinine in hypodermic injections and tincture of nux vomica does not always produce the needed strychnine effect. There is a marked difference in the medicinal effects of a galenical and of the alkaloid which it contains and that is the objection to the attempt to make a cult of alkaloidal therapy. Dr. Cohn would be perfectly satisfied if acetphenetidine and acetanilide should become permanently unprocurable. In closing, he discussed the U. S. P. IX, pointing out that the remedies included therein represented a mean between

those of the sub-committee on scope, who desired the omission of every drug that had not been proved by laboratory experiment of therapeutic value, and those who wished to introduce everything that had been used as a medicine.—J. Am. Pharm. Assoc., 5 (1916), 606.

BIOLOGY.

Animal versus Vegetable.—J. U. Lloyd with his characteristic virility discusses the similarities and differences between members of the animal and vegetable kingdoms, pointing out that many members of the vegetable kingdom have characteristics that at first hand appear to be native to those of the animal kingdom only, such as power of movement as displayed by the sensitive plant (Mimosa pudica), and *vice versa,* that some members of the animal kingdom exhibit traits usually confined to the vegetable kingdom, such as the life habits of sponges, and further points out the difficulty of classifying microscopic unicellular life as animal or vegetable in nature. Under the subheading Organic *versus* Inorganic, he ably combats the idea that living things are composed of organic and inorganic components, simply because we, in burning a living thing, produce ashes, which contains potassium, magnesium, iron, etc. He argues that these exist in the plant or animal in organic combination and that they are as much organic as the hydrogen, oxygen or nitrogen that escapes in the burning. Further he believes the study of substances such as alkaloids, glucosides, etc., obtained by destroying the living plant is not a study of the make-up of the living plant; concluding that the lines of demarcation between animal and vegetable and organic and inorganic are far from being as apparent as they would seem.—Am. Drug., 64 (1916), 6. (B. J. D.)

MICROSCOPY AND HISTOLOGY.

The Microscope and the Practical Man.—A brief review by C. W. Ballard of the manifold uses of the microscope and the varied applications of the instrument to practical laboratory work. Comment is made upon the increasing use of micro-analytical methods in many kinds of commercial work such as foods and drugs, metallurgy, mineralogy, textiles, papers, bacteriology, pathology and microchemistry. There are brief paragraphs dealing with these various phases of microscopical work and notes on some of the methods employed.—C. U. C. P. Al. J., 23 (1916), 46. (C. W. B.)

Microscopical Methods.—At a meeting of the Society of Public Analysts, H. C. Greenish explained methods that he had found satisfactory and was in the habit of employing for examining, identifying, and determining the purity of a simple powder, and for ascertaining the composition of a mixed powder.

He explained the advantages that may be derived from concentrating certain tissues by the removal of other constituents by suitable means, and described a method for determining whether a powder had been prepared from worm-eaten material.

He dealt finally with a method for the treatment of fæces in order to separate the undigested vegetable and animal matter for the detection of the tissues of ingested drugs.—Chem. News, 113 (1916), 238.

Quantitative Microscopy.—At a meeting of the Society of Public Analysts, T. E. Wallis stated that quantitative results based on microscopical work have hitherto failed to obtain recognition such as is accorded to similar results based upon chemical processes. By adopting the procedure outlined below, the author shows that a high degree of precision can be given to quantitative work with the microscope, which has a unique value in those instances where chemical methods are inapplicable. Equal weights of the material under investigation and of a standard mixture for comparison are separately mixed with similar weighed quantities of lycopodium spores. The mixed powders are suspended in a suitable fluid, and two slides are prepared from each suspension. Ten fields, selected according to a prearranged plan, are counted on each slide, and the average ratio of the number of particles of substance to be determined to the number of lycopodium spores present is found, and reduced in each case to the number corresponding to 100 lycopodium spores. The figures so obtained are proportional to the quantities of material present in the substance and in the standard mixture, respectively. A simple calculation gives the quantity sought.

The accuracy and utility of the method are shown by experiments with typical mixtures, including wheat flour, potato starch, and mustard, each mixed with corn flour; wheat flour containing potato starch; white pepper adulterated with ginger and with rice starch; and gentian root with added coconut shell.—Pharm. J., 97 (1916), 467.

Powdered Vegetable Drugs.—*Key to Study and Identification.*—Albert Schneider presents a key to enable one to identify powdered

drugs without the aid of a compound microscope. The table published gives the characteristics of some two hundred and twenty-five drugs.—Pacif. Pharm., 10 (1916), 152. (C. M. S.)

Vegetable Histology.—*Use of Polarized Light in.*—In considering this subject, C. W. Ballard notes that comparatively little attention has been given this form of illumination in plant work. The types of polarizing apparatus and the optical combinations to be used to best advantage are described. Points to be noted in the examination of tissues and cell-contents by polarized light are: partial or total disappearance with crossed prisms, markings observed on rotation of prisms and coloration upon rotation. The appearances of common plant tissues and cell-contents under polarized light are described. The apparatus is of great value in determining minute structural details and in the micro-analysis of starches, crystals, fibers and mucilage-sacs.—J. Am. Pharm. Assoc., 5 (1916), 1323. (C. W. B.)

PHARMACOLOGY.

Drugs and Medicinal Agents.—*Professional and National Viewpoints.*—The importance of drug therapy is emphasized by A. D. Blackader. He says that ailing patients demand some mitigation of their troubles and by means of official drugs, properly employed in proper doses, we are able to give all possible relief. He deprecates the long list of drugs in the Pharmacopœia. In his teaching work he yearly decreases the number of those taught to his students and emphasizes to them the greater importance of knowing a few drugs thoroughly, rather than of knowing many drugs imperfectly. An absolute veto must be placed on the use of proprietary combinations with patented names, or on any preparations of which the formula is hidden or obscure. Another important fact which has to be recognized to-day is the number of new synthetic drugs which have been introduced to the profession by German manufacturing houses. A few of these have proved of very definite value, replacing many of our older drugs; the great majority of them, however, have proved failures. In prescriptions, Blackader says, avoid the use of all patented names and use only the official or the correct chemical name. Much more objectionable even than the patented names of new synthetic drugs are the proprietary names representing the semi-secret and patented preparations of many large manufacturing

drug houses.—Canadian Med. Assoc.; through J. Am. Med. Assoc., 67 (1916), 467. (W. A. P.)

Proper Self-Medication.—In the course of his testimony in the "Cardui" trial, John Leeming, M.D., explained the extent to which self-medication is to be encouraged. Asked if it was very dangerous for a person who thinks he has a cold to take some aspirin without going to a doctor, he replied that, while in exceptional cases it might be exceedingly dangerous, in most cases of simple cold it would not be so in that Nature's recuperative powers would in most cases throw off such a cold. He explained that he always advises his patients how to treat themselves for simple ailments and to come to him when there are danger signs. Asked if it was dangerous for a person with a cough to get any medicine without a diagnosis, Dr. Leeming replied that it would not be dangerous at all if the person understood his case and in consultation with his doctor he has been generally advised. In families where he is the attending physician he often advises not to send for him in case of a slight cold, but to take a little medicine that will help Nature to throw it off.—J. Am. Med. Assoc., 66 (1916), 1330. (W. A. P.)

Pharmacologic Superstitions.—There are a number of worthless therapeutic practices—some based on abandoned theories of pathology, some due to technical errors in pharmacologic investigations, some based on misinterpreted clinical observations, and some the mere relics of medieval superstition—which still persist in common use. The first edition of the U. S. Pharmacopœia was published less than a century ago. Of 624 drugs and preparations deemed by the editors of that work to be "those, the utility of which is most fully established," 305 have been already despoiled of their official recognition.

Horatio C. Wood, Jr., judges among other traditional remedies: 1. Compound Syrup of Hypophosphites. An unbiased study of the evidence, he states, must inevitably lead to the conclusion that any therapeutic virtue in the compound syrup of hypophosphites is due to the sugar it contains. 2. Lithia. It is evident that science lends no support to the use of lithium in medicine. The clinical evidence in this disease is peculiarly unreliable. 3. Sarsaparilla. Various preparations of sarsaparilla, mostly of proprietary nature, are widely used by the public as "blood purifiers." Sarsaparilla has a mild diaphoretic tendency, and might therefore be of some assistance in this eliminative therapeusis. Among the medical profession, however, it never enjoyed any great vogue

except in the treatment of syphilis. There is absolutely no explanation of any possible mode of action of the drug. The clinical evidence of the usefulness of sarsaparilla is both scanty and unreliable. 4. Basham's Mixture. While there is no doubt as to its acidity and astringency, it is peculiarly liable to disturb the digestive tract. Outside of this and the local effects of certain salts, there is no known physiologic action of iron which gives any ground for its therapeutic employment. 5. Ferric Chlorid. Ten minims of the tincture contain less iron than a single Blaud's pill. As an external remedy for checking hemorrhage it is very valuable; as an internal drug it should never be employed. 6. Opium is of small value as a local remedy.—J. Am. Med. Assoc., 66 (1916), 1067. (W. A. P.)

Antiseptics.—*Used in War.*—The research described by N. Fiessinger, C. O. Guillaumin, P. Mouiroud and G. Vienne was done with eight of the antiseptics currently in vogue, including 1 : 1,000 mercuric chloride and Dakin's hypochlorite solution. The effect on the leukocytes was estimated from the movements of the granules and the staining properties as well as from the breaking up of the cell. Illustrations are given as to the aspect of the cell at different periods under the influence of the various antiseptics. The alkaline hypochlorite solutions have a prompt dissolving action, liquefying the pus, red corpuscles and blood clots in the wound. This dissolving action is the work of the sodium, and it is annulled by too much boric acid and by salt. Living tissue protects itself against this dissolving action by its salt content. Irritation of the tissues around a wound being irrigated with hypochlorite solution can be warded off by keeping them covered with a compress moistened with a 20 or 40 : 1,000 salt solution. Charts and tables are given to illustrate this protective action of weak salt solution, effectually protecting the cells and tissues against harm from the hypochlorite solutions. Dakin's formula insures sufficient dissolving action while but slightly irritating normal tissues, and this irritation can be warded off with the 2 or 4 per cent. salt solution, the hypochlorite and salt just balancing each other. Ann. de Méd.; through J. Am. Med. Assoc., 66 (1916), 1894. (W. A. P.)

Antiseptics.—*Relative Activity.*—R. A. Lambert has experimented with living infected and non-infected human tissues, employing *in vitro* various antiseptics under conditions closely analogous to those which obtain in ordinary practice. Of all the germicides tested, iodine was the only one which killed Staphylococci in

strengths which did not seriously injure the cells and tissues. The other antiseptics used were: Mercuric chloride, potassium-mercuric iodide, potassium cyanide, sodium hypochlorite, phenol, tricresol, hydrogen dioxide and alcohol. Hydrogen dioxide was found to have a very low bactericidal power under these conditions. The results in the main confirm clinical experience.—J. Am. Med. Assoc., 67 (1916), 1300.

Antiseptics.—*Relative Activity of Mercury and Coal-Tar Derivatives.*—H. C. Hamilton defines the meaning of the term, points out the necessity for, describes the many methods and the conditions which determine the method to be followed in a particular case. Mercuric iodide may often displace the more commonly used corrosive sublimate with better germicidal value and less corrosion of both metal and tissue. He points out that the greatest efficiency in the use of formaldehyde is obtained only when the air in the space to be disinfected is brought almost to the saturation point of humidity before liberating the gas. Standardized soap solutions of phenol and cresol seem to furnish the most convenient and desirable disinfectants for general use.—Bull. Pharm., 30 (1916), 462. (C. M. S.)

Bitter Tonics.—*Influence on Gastric Secretion.*—L. O. Moorhead, when experimenting on healthy dogs, found that bitter tonics, acting either in the mouth or in the stomach, (1) have no appreciable influence on the appetite; (2) have no consequential influence on the quantity of the gastric secretion, although a slight uniform depression is noted from their action in the stomach; (3) have no significant influence on the quality of the gastric secretion, although a slight rather uniform depression is observed in the free as well as in the total acidity from the action of the drugs in the mouth. The experiments on cachectic dogs go to show that bitter tonics, acting both in the mouth and in the stomach, (1) exert a favorable and significant influence on the appetite; (2) cause an increase both in the quantity and quality of the gastric juice secreted during the hour following the meal. The increase is not great enough to bring either the quantity or the quality of the juice up to that secreted by the normal dog, but is marked enough to be worthy of note.—J. Pharmacol.; through J. Am. Med. Assoc., 66 (1916), 535.

Emetic Action of Drugs.—The investigation of R. A. Hatcher and C. Eggleston shows that the nauseant and emetic action of many drugs is not due to their effects on the stomach, but to a

central action on the "vomiting center." Practically all alkaloids and alkaloidal drugs which have emetic properties, including morphine and preparations containing it, emetine, cephæline, quinine, nicotine, lobeline, pilocarpine, aconite and veratrine, ergot and apomorphine, which produce nausea or vomiting as their chief or side actions, do so by direct effect on the vomiting center. Sodium salicylate, picrotoxin and digitalis also produce vomiting through central action. These investigations show the futility of the many devices which have been employed in attempts to avoid the nausea or emesis produced by many drugs as an undesired side-effect.—J. Am. Med. Assoc., 66 (1916), 817. (W. A. P.)

Heart Tonics.—*Their Standardization.*—In an article on the standardization of heart tonics, E. Hercod points out the variability of such drugs as digitalis and strophanthus and gives a résumé of the different methods which have been suggested for the standardization of such drugs.—Chem. and Drug., 88 (1916), 147 and 803. (K. S. B.)

Intravenous Therapy.—The technic, although not difficult, must be thoroughly mastered, or undue pain, infection, air embolism, or even death may result. Often a drug has an action different from that obtained by the usual method of administration. Deaths have resulted not only from a lack of proper technic, but also from a lack of knowledge of drugs so administered. Thus death has followed the injection of an iron preparation containing peptone, and also following intravenous injection of ether. Intravenous injections, while sometimes superior to the slower methods, are distinctly inferior when a continuous rather than a sudden action is desired as with iodides, nitrites, iron or salicylates. Intravenous injections should not be resorted to unless distinct advantages are to be secured, as when immediate action is necessary in emergencies, where the drug is not otherwise absorbed or is destroyed in the stomach. In the light of our insufficient knowledge of the action of simple drugs when administered intravenously, the injection of complex mixtures of drugs is particularly reprehensible.—J. Am. Med. Assoc., 67 (1916), 1450. (W. A. P.)

Malaria.—*Prevention in the Army.*—To protect soldiers in Salonica from malaria-carrying mosquitoes an ointment prepared by the Pasteur Institute is applied to the hands and face. The ointment is put up in tin tubes, has the consistency of collodion, and has an odor resembling that of tar. Quinine in daily doses

of 6 grains and quinine injections are also used.—Chem. and Drug., 88 (1916), 964. (K. S. B.)

Opiates.—*Idiosyncrasy.*—Leclerc reports on a peculiar case of idiosyncrasy towards opiates. A young woman suffering from lumbar pain had applied an embrocation containing 5 per cent. of laudanum. One hour after the application of the preparation an erythematous eruption accompanied by intense itching appeared on the neck and arms and the patient complained of severe headache and vertigo. A short time later the woman, suffering with grippe, was given a syrup which contained 2 milligrammes of extract of opium to the dose. The same symptoms appeared. On a third occasion a decoction of fresh poppy flowers was administered to her and again erythema, pruritus, etc., were produced. This was the more astonishing since, according to the latest investigations, poppy flowers contain the alkaloid rhœadine, but none of the opium alkaloids.—L'Union Pharm.; through Drug. Circ., 60 (1916), 487.

Spices as Preservatives.—Elaborate experiments detailed by Freda M. Bachmann show that spices, as used in the kitchen in the usual amounts for flavoring purposes, such as in spiced cakes, do not exert any considerable preservative effect. When cinnamon, cloves, or allspice are used in large amounts the growth of moulds may be retarded. This effect is greater when the spice is combined with vinegar. It seems possible that the active principles of these spices, especially cinnamic aldehyde, could be used in such dilutions as to prevent the growth of many micro-organisms, and yet in small enough quantities not to spoil the flavor of the product. Pepper and nutmeg have but little direct effect on the growth of micro-organisms. Cinnamon is the most effective spice for this purpose. Similar results were obtained with culture experiments with the essential oils and alcoholic tinctures of the spices, confirming the fact that cinnamon is the most effective spice for preservative purposes, followed by cloves and allspice. Bacteria appear to be less sensitive to spices than moulds.—J. Ind. Eng. Chem., 8 (1916), 620.

A Study of "Uterine" Drugs.—J. D. Pilcher, W. R. Delzell and G. E. Burman, of the Nebraska Medical School, have studied the action on the excised guinea-pig uterus of a number of drugs which are constituents of proprietary and "patent" "female" remedies; drugs for the value of which there is little evidence and

which would have fallen into disuse but for their exploitation. The following drugs lessened the amplitude of the contractions of the uterine strips, or in stronger solutions caused a complete cessation: Unicorn root, pulsatilla, Jamaica dogwood and figwort. Somewhat less active were valerian and lady's-slipper. The drugs having very weak actions were wild yam, life root and skull-cap. Blue cohosh was most active and put uterine strips in a state of tonic contraction or tetanus. The following drugs were quite inactive: black haw, cramp bark, squaw vine, chestnut bark, false unicorn, passion flower, blessed thistle, St. Mary's thistle and motherwort. The authors are confident that the actions observed would also be produced in the intact human uterus provided the drug reached the uterus in a similar concentration but that it is improbable that the concentration of drugs used could ever be attained in the body. Work which is under way indicates that these drugs do not act specifically on the uterus but on smooth muscle in general and that this general action would overbalance any favorable action on the uterus. The authors conclude that the drugs examined are practically worthless and that their use is harmful as well as futile since such use tends to perpetuate therapeutic fallacies.—J. Am. Med. Assoc., 67 (1916), 490. (W. A. P.)

DRUG STANDARDIZATION.

Drug Assays.— *Use of Plants in.*—W. M. Saylor conducted some experiments to determine the toxicity of drugs by the use of plants. Seedlings of Pisum sativum and Lupinus albus were the only ones found to give satisfactory results and Lupinus albus was used in most of the experiments.

The seeds of the plants were soaked in water for twenty-four hours, then placed upon moist sphagnum in a dark place, at a temperature of from 18° to 20° C., and allowed to germinate. When the radicles reached a length of from twenty-five to forty millimeters they were marked, twenty millimeters from their tip, with indelible water-proof India ink.

Ordinary jelly glasses were used as containers, and fifty mils of each solution used. Flat pieces of cork, about three by four inches, were used as covers for the glasses. One piece of cork was used to cover two glasses, and was placed so that each of two opposite corners of the cork was about over the center of the container. A small glass rod was placed through each of these two corners. The lower end of this rod passed through an ordinary

No. 6 cork which contained four staples used as carriers for four growing radicles. Hence four radicles were growing in each solution.

The seedlings were suspended so that the radicle passed through the staple and just the growing tip reached below the surface of the solution.

Various strengths of solutions of strychnine sulphate and nitrate were used and in both cases the $1^4/_5$ grains of solution killed in twenty-four hours and the radicle did not advance in length a fraction of a millimeter, while in the $1^3/_5$-grain solution there was a growth of from one-half to one millimeter, and in the two-grain solution the radicle had shrunk and did not measure the original twenty millimeters from the mark.

More or less irregular growths are obtained in the weaker dilutions, while nearer the toxic point a gradual decline in activity and growth is noticed.

A comparison of the strychnine tables with those of distilled water showed that strychnine first stimulated the growth of the plant, but as the solutions grew stronger the plant weakened, the ultimate result being the death of the plant, just as is the case with animals.

For each toxic substance there is a definite point in strength beyond which the seedling plant under the influence of that substance will not grow or live.

Other substances used were ethyl alcohol, an 8 per cent. solution of which was toxic in twenty-four hours; tincture of nux vomica, a 14 per cent. solution of which killed in twenty-four hours; fluid-extract of digitalis, a 1.25 per cent. solution of which was toxic in twenty-four hours.

The greatest variation from actual strength shown by this method on a series of "unknowns" was 5 per cent. Saylor therefore concludes that there is a certain degree of reliance in this method of standardization and because of its inexpensiveness and ease of application should recommend itself to retail druggists making their own preparations.—Am. J. Pharm., 88 (1916), 8. (R. P. F.)

Drug Ash.—*Cause of Variation in.*—A. Tschirch thinks that the glandular hairs and the stickiness of young haired leaves is a factor since mineral dust becomes more firmly attached to such plant parts: digitalis (normally 7 to 9 per cent. of ash) have shown 33 per cent.; hyoscyamus (normally 17–19 per cent.)

have shown 72 per cent.; sage (normally 10 per cent.) have shown 60 per cent.; kamala (normally 4 to 6 per cent.) have shown 43 per cent.; anise (normally 10 per cent.) have shown 49 per cent. Glabrous leaves, like coca, on the other hand, usually have normal ash content. Saffron usually runs about 4 to 6 per cent. ash and anything more than 18.5 per cent. suggests adulteration. These facts emphasize the necessity of supplementing the chemical analysis of drugs with microscopic examination.—Schweiz. Apoth. Ztg., 54 (1916), 461; through Chem. Abstracts (1917).

DRUG HISTORY.

Anesthetics.—*History of.*—H. A. Kirby in a graduation thesis gives a very interesting account of the history of anesthetics from the time of Homer to the present day. He points out that Homer, Herodotus, Dioscorides and Pliny all mention anesthetics in their writings. The more important anesthetics are taken up and their history described in detail. Laughing gas was the first one, followed by ether, chloroform, etc.—Drug. Circ., 60 (1916), (H. H. S.)

Pharmacopœial Botanic Drugs of the Twentieth Century.—E. N. Gathercoal has undertaken to make a list of the various botanic drugs that are recognized in nineteen different pharmacopœias. The list, while made originally as a check list for a pharmacognosy museum, nevertheless presents an interesting study. The list includes 550 drugs, and represents all the botanic drugs official in the various pharmacopœias excepting that of Mexico. In this volume more than 700 are recognized, many of which are native to that country and are not recognized by any other pharmacopœia. For this reason only those which are also recognized by other countries are included in the list. Of the total number, 37 are recognized in each of the pharmacopœias, 19 are included in all but one, 10 in all but two, and 12 in all but three, while 136 are recognized in but one pharmacopœia and 94 in but two of them. The following list may be looked upon as the universal one, finding a place in each of the volumes consulted: Anise, belladonna leaves, benzoin, bitter orange peel, camphor, cascara bark, castor oil, cinchona and red cinchona, cloves, copaiba, croton oil, cubebs, ergot, fennel, foxglove, gentian, golden seal, gum arabic, henbane, ipecac, jalap, male fern, nux vomica, oil of anise and anethol, oil of cloves and eugenol, oil of peppermint, opium, Peru balsam, rhubarb, rosin, senega, senna, squill, storax, strophanthus,

sweet almond, valerian root. It is also interesting to note that of the 230 drugs recognized in but one or two pharmacopœias, 29 are found in the U. S. P. VIII, 17 of which, however, have been omitted from the U. S. P. IX.—J. Am. Pharm. Assoc., 5 (1916), 286. (L. S.)

Medieval Animal Drugs.—*Those Used in England and France.*—George C. Marshall at the San Francisco meeting of the Historical Section of the American Pharmaceutical Association, presented in abstract an academic dissertation on medieval animal drugs which showed an immense amount of literary research on the part of the writer. In the words of William C. Alpers, Dean of the Cleveland School of Pharmacy, "There is no statement in this thesis that has not been traced back to the original writer, and the amount of correspondence and expense that Mr. Marshall undertook to collect his material is most remarkable. The bibliography attached to the thesis shows that he was not satisfied to copy from modern authors, but in every case he went back to the original." As even the abstract is so long that it could not be done proper justice in a short review, the reader is referred to the original printed abstract.—J. Am. Pharm. Assoc., 5 (1916), 482. (L. S.)

Drugs, Spices and Dyestuffs.—*East Indian Commerce in the Sixteenth and Seventeenth Centuries.*—At the San Francisco meeting of the American Pharmaceutical Association, A. W. Linton submitted a long and interesting article which shows an immense amount of reading of ancient and modern literature covering the field of commerce during the period mentioned. He outlines the voyages of those brave men who in quest of spices went to far-off lands both known and unknown; of the voyages which eventually led to voyages of discovery. Ancient Venetian, Portuguese, Spanish, Dutch and English commerce of the time are carefully and entertainingly discussed as well as the cargoes which were carried by these ancient mariners. The article is too long to be abstracted with any satisfaction and the reader is therefore referred to the original paper.—J. Am. Pharm. Assoc., 5 (1916), 250, 366, 471 and 574. (L. S.)

Cardiac Tonics.—*History of Their Introduction into Medicine.*—Gordon Sharp writes of the great value of cardiac tonics and discusses their history in an interesting manner.

Digitalis was introduced by Withering, a doctor of medicine

of the University of Edinburgh. A complete history was published in the "Pharmaceutical Journal" for May, 1908.

Strophanthus is known in Africa as Kombé or poison bean. The scientific name was given the plant by Decandolle (1778–1841). Livingston first suggested its cardiac action; the detection between true and false strophanthus by the sulphuric acid reaction was first pointed out by E. M. Holmes; while Fraser conducted his classic investigation of strophanthus from 1869 to 1885.

Other cardiac tonics described by Dr. Sharp in the paper are scoparius and convallaria. The paper closes with a summary of the relative activity, utility and similarity of the cardiacal glucosides found in the drugs mentioned above.—Pharm. J., 96 (1916), 347. (F. H.)

Drugs of Shakespeare.—A résumé of the medical aspects of Shakespeare's works, with his references to drugs and remedies, is published by C. C. Bell in connection with the Tercentenary Celebration of Shakespeare's birth.—Chem. and Drug., 88 (1916), 765. (K. S. B.)

DRUG CURING AND PRESERVATION.

Stabilization of Drugs.—*A Simple Method.*—In view of the fact that many drugs deteriorate upon drying, due to the action of ferments, it has been found desirable to stabilize such drugs by destroying the ferment. The simplest method so far devised consists of exposing the drug to alcohol fumes. P. van der Wielen accomplishes this by means of an apparatus consisting of a flask in which alcohol is boiled, a second flask containing the drug suspended upon a wire screen, and a condenser to recover the alcohol. The alcohol fumes are led into the second flask under the screen, this flask being kept warm by a water-bath, and permitted to rise up through the drug, escaping through the condenser. Undesirable ferments in leaves may be destroyed in from forty seconds to ten minutes. Dried seeds, such as bitter almonds, should first be soaked in water, when they may be stabilized in thirty or forty minutes, requiring over an hour if not first moistened.—Chem. and Drug., 88 (1916), 775. (K. S. B.)

Green Plant Drugs.—*Plea for Their Use.*—H. W. Jones quotes authorities as to the value of certain indigenous drugs and finds that those denouncing them as worthless have used dried drugs, while those extolling their virtues have used green drugs. He urges a fair trial of galenicals made from green drugs and suggests

besides the official tincture of fresh drugs the stabilizing of drugs by treatment with heated alcohol vapor.—J. Am. Pharm. Assoc., 5 (1916), 1340.

Green Plant Drugs.—*Dialysates from.*—For making dialysates of fresh digitalis leaves or other fresh plants van der Wielen recommends treating the plants with alcohol vapors in order to destroy the enzymes. The plant thus treated is then reduced to a pulp and this mass is transferred to a filter of parchment paper placed in a funnel provided with a stop-cock. Ten per cent. alcohol (25 grammes for each 250 grammes of pulp) is then poured in between the funnel and the filter and allowed to remain for four days after having covered the funnel with a glass plate. The alcohol is then drawn off and the dialyzing is repeated in the same manner with the same quantities of 20, 30, 40, 50, 60, 70, 80 per cent. alcohol, and finally twice with 90 per cent. alcohol. By these 10 treatments the drug is exhausted.—Pharm. Weekblad; through Drug. Circ., 60 (1916), 757.

PERFUMERY MATERIAL.

Perfumes.—*Source, Preservation and Sale of.*—An interesting paper on this subject by William A. Hall brings out the following important points in the manufacture and selling of perfumes: The best perfumes are made from pomades and the best pomades are made in France and Bulgaria, where roses and other flowers are raised for the purpose. Some pomades are made with melted fat and some of the more delicate ones by cold processes, chiefly by covering layers of pure fat with alternate layers of flowers. The best fat for pomade making seems to be beef suet mixed with the fat of corn-fed hogs. In making pomades about equal weights of flowers and melted fat are used and macerated during a period of twenty-four hours, then drained and more flowers added. This continued until the fat is apparently saturated. The extraction of a pomade with alcohol does not constitute a perfume. Various other fixatives are employed such as musk, ambergris civet, etc. The perfume gets its name from the odor which predominates, that is, the one substance which is added in excess. Bulk perfumes should be kept under glass protected from direct sunlight, dust and dirt. The stoppers should be frequently cleaned. When showing perfumes to a customer it is best done by putting a drop on absorbent cotton, or on a piece of rice paper such as cigarette papers. It is recommended to keep small labelled empty bottles

in the perfume case to be marked when selling, thus avoiding the use of a graduate, which in many stores is the same one all the time and probably never washed. Perfumes made from synthetic substances while fragrant at first rapidly lose their odor while those made from pomades are more lasting. Do not stock more than about a dozen popular odors in bulk and a few specialties.—J. Am. Pharm. Assoc., 5 (1916), 509. (L. S.)

Odors.—*Classification of.*—E. J. Parry, after pointing out the absence of a scientific classification of odors, suggests the following generalization of the difficult subject:

Alcoholic odors may be grouped: (*a*) fruity odors of the higher fatty alcohols; (*b*) soft rose-like odors of the di-olefinic alcohols, such as geraniol; (*c*) soft heavy odors of the cyclo substituted aliphatic alcohols, such as benzyl; (*d*) sharp camphoraceous odors of the terpene alcohols; (*e*) heavy "oriental" odors of the sesquiterpene alcohols; (*f*) phenolic odors.

Esters odors may be considered either in the light of the alcohol constituent modified by the acid radicle or as the acid constituent influenced by the alcohol radicle.

Ketones and *aldehydes* usually have odors sufficiently distinctive to enable one to speak of "aldehyde" and "ketone" odors.—Perf. Essent. Oil Record; through Chem. Abstracts, 10 (1916), 2121.

B—Vegetable Drugs

Acacia.—*Qualitative and Quantitative Tests for.*—Waters and Tuttle report a careful study of the various tests for gum arabic, the paper giving a bibliography with 33 titles. Qualitatively, the precipitate with basic lead acetate is most characteristic, giving a dense precipitate with gum arabic, a cloudiness with gum ghatti or with dextrin and with gum gedda, a precipitate that is distinctly less than that produced with acacia. Alkaline copper sulphate reagent and a weak alcoholic solution of neutral ferric chloride also afford means of distinguishing between the four gums just mentioned. After experiments with the published processes for the quantitative determination of gum acacia, the following was finally devised as the most satisfactory method: Fifty grammes of copper acetate are dissolved in water, an excess of ammonia is added, and the solution is diluted to 1,000 mils with distilled water and alcohol, in such proportion that the final product con-

tains 50 per cent. by volume of the latter. For each determination 50 mils of a solution, representing 0.25 gramme of the original gum, are mixed with an equal volume of alcohol; the 25 mils of the copper reagent are added, with constant stirring. After the precipitate has subsided, it is collected on a tared filter, washed with 50 per cent. alcohol containing ammonia, then with 75 per cent. alcohol, and finally with 95 per cent. alcohol. It is dried to constancy at 105° C., weighed, ignited, and the ash weighed. The ash is deducted from the weight of the precipitate and the difference taken as "net gum arabic." The amount of moisture in the gum must be determined in a separate portion by drying at 105° C. in a current of hydrogen.—J. Ind. Eng. Chem., 8 (1916), 413.

Aconite.—*Cultivation in Russia.*—Kourrote reports that large quantities of medicinal plants are cultivated in Bessarabia and the Crimea. The climate and soil in these Russian provinces seem to be very favorable for the plants, since the author analyzed various samples of Aconitum orientale, which contained an average 2.2 per cent. of alkaloids and of Veratrum album, which contained 0.85 per cent. of jervine.—Pharm. J.; through Drug. Circ., 60 (1916), 484.

Aloes.—*A New Color Reaction.*—A pink coloration sufficiently delicate to detect one part of Barbadoes aloes in 10,000 is produced by the addition of a freshly prepared solution of potassium ferricyanide to a cold aqueous solution of the aloes, says C. E. Stacy. He claims to be able to distinguish certain different varieties of aloes from each other and from commercial aloin by the intensity of the color reaction.—Chem. and Drug., 88 (1916), 68. (K. S. B.)

Algerita Root.—*Berberine in.*—M. C. Hart describes the root of Odostemon trifoliatus, a plant growing in Old and New Mexico, where the root is reputed of value for eye sores, sore mouth and for gonorrhea. He finds that it contains 1.49 per cent. of berberine and that it is free from hydrastine.—Am. J. Pharm., 88 (1916), 301.

Amaryllis Belladonna.—*Source of False Belladonna.*—F. B. Kilmer has had submitted to him, a so-called "belladonna root" which turned out to be the bulb of Amaryllis belladonna, which is sometimes called "belladonna lily." Analysis of it disclosed the presence of alkaloids, which in the crude form was submitted to R. A. Hatcher as an "unknown." Dr. Hatcher reported that its

action upon dogs and cats was similar to but not identical with hydrastine, its feeble mydriatic action suggesting hydrastinine.

Kilmer expresses regret that this plant should be given a name confusing it with belladonna. He also considers that it was a mistake on the part of Fragner in 1891 to call the alkaloid that he isolated from the plant, "bellamarine."—J. Am. Pharm. Assoc., 5 (1916), 1202.

Amber.—*Differences between Italian and German.*—L. Reutter shows that Italian and German amber may be distinguished readily by chemical tests. Italian amber, when treated with ether and then with alcohol, gives residues which are mainly amorphous. Baltic amber, under like treatment, yields crystalline residues. The ether and alcohol solutions of Italian amber give a green color zone when floated on nitric acid but give no white crystalline deposit. Baltic amber thus treated gives no green color. Italian amber has a higher melting point than German; the alcoholic solutions are brownish, not yellow. The residue of Italian amber, insoluble in ether and in alcohol, is almost wholly amorphous; that of Baltic amber is crystalline. Italian amber contains only 1 to 16 per cent. of succinic acid. Baltic amber gives 65 to 80 per cent. Consequently there is no difficulty in distinguishing the two kinds, and in referring amber ornaments to their correct geographical source. These tests have enabled the author to determine that a number of prehistoric amber ornaments from Southern Europe are of Italian and not of Baltic origin, while others found in Prussia were the latter. The subject is of considerable ethnological interest since it disproves the existence of early commerce between the Northern and Southern races, and establishes the fact that the lacustrian inhabitants of Switzerland and Northern Italy had considerable communication with the people of the South.—Comptes rend.; through Pharm. J., 96 (1916), 401.

Aralia and Panax Species.—*Characteristics of.*—Theodore Holm contributes a series of articles on this subject, illustrated by many original drawings. The genera, Aralia and Panax, have been merged by several authors, notably Gray. Three species of Aralia were formerly recognized by the U. S. Pharmacopœia. A. nudicaulis yields the drug Aralia. Its constituents are resin, oil, tannin, an acid, albumin, mucilage and cellulose (Alpers and Murray). The sesquiterpene isolated by Alpers differs from isomeric compounds and was named by him "araleine." A. racemosa, while

resembling A. nudicaulis, is more spicy. Rhizomes and roots of both species are used like sarsaparilla in decoction or infusion form. The bark of the stem and root, also the fruit of A. spinosa are used similarly but are more active than the other species. An infusion of the recent bark is emetic and cathartic. This drug has been used externally as an antidote to rattlesnake bites. A tincture of the fruit relieves rheumatic pains, colic and toothache. The drug contains starch, glucose, gum, pectin, two acrid resins, volatile oil (C. W. Elkins) besides tannic acid and the glucoside "aralin." (L. H. Holden).

Panax quinquifolium, yielding the drug Panax, resembles P. ginseng, which yields Chinese ginseng. The root is the part employed and although hardly used here, is collected in this country for export to China. It is a mild demulcent, although the Chinese consider it a remedy for nearly all diseases. When dry the root is yellowish white, wrinkled externally and consists of a hard central portion surrounded by a soft bark. It has not been accurately analyzed, but S. S. Garrigues has isolated "panaquilon." The latter is an amorphous, yellow powder, soluble in water and alcohol and insoluble in ether. It is sweet-bitter in taste and is converted by strong acids to "panacon" with the liberation of carbon dioxide and water. Panacon is insoluble in water and white in color.

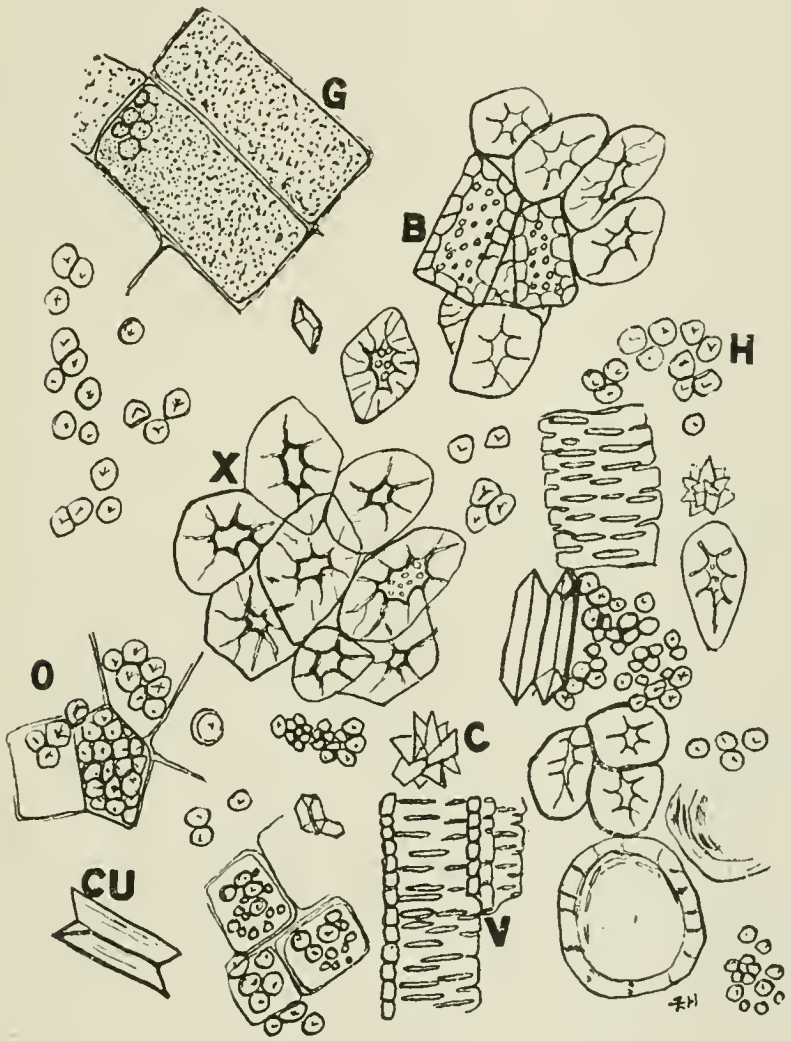
Complete and minute descriptions of Aralia nudicaulis, A. racemosa, A. spinosa and Panax quinquifolium are given. The fact that seedlings bear but one ternate leaf with cotyledons probably subterranean, is commented upon. Panax trifolium, which is noted as having no medicinal value, is also included in the botanical descriptions.

The articles give minute descriptions of the structure of the various plants discussed. The roots of all species are similar. Tuberous rooted panax is distinguished by the presence of pith, while the root of P. trifolium has heterogenous cork. The rhizome pith of A. nudicaulis contains neither starch nor crystals and the oil-ducts, 6 to 8 in number, are in a circular band while the rhizome pith of P. quinquifolium contains starch and a single oil-duct in center. Pith of P. trifolium is destitute of ducts. The anatomy of the above-ground portions is described in detail and particular attention is directed to the fact that the bundles of P. trifolium are concentric and the leptome surrounds the hadrome thus being contrary to the usual arrangement even in monocotyledons. In

P. quinquifolium we see a tendency for leptone to encircle hadrome but the encircling is always incomplete.—Merck's Rep., 25 (1916), 11, 62 and 117. (C. W. B.)

Asclepias Tuberosa.—*Structure and Substitutes.*—At the meeting of the New York State Pharmaceutical Association, Fanchon Hart described the gross characters and microscopical structure of Asclepias tuberosa, A. syriaca and A. decumbens. Species syriaca and decumbens are often substituted for the official drug.

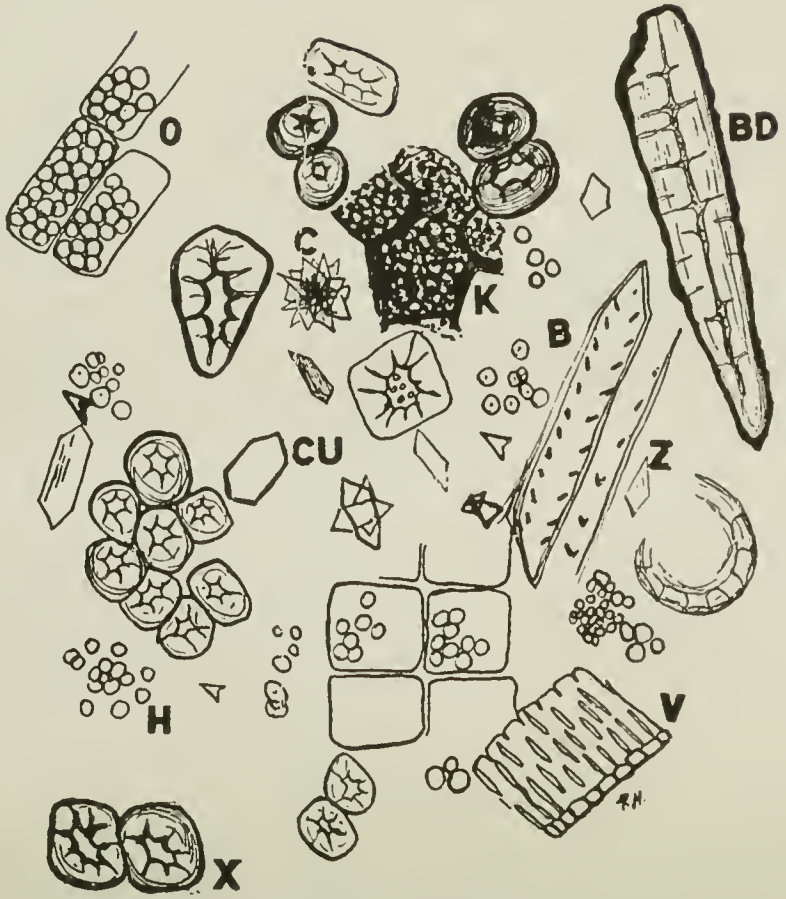
Fig. 21.



Asclepias Structure.

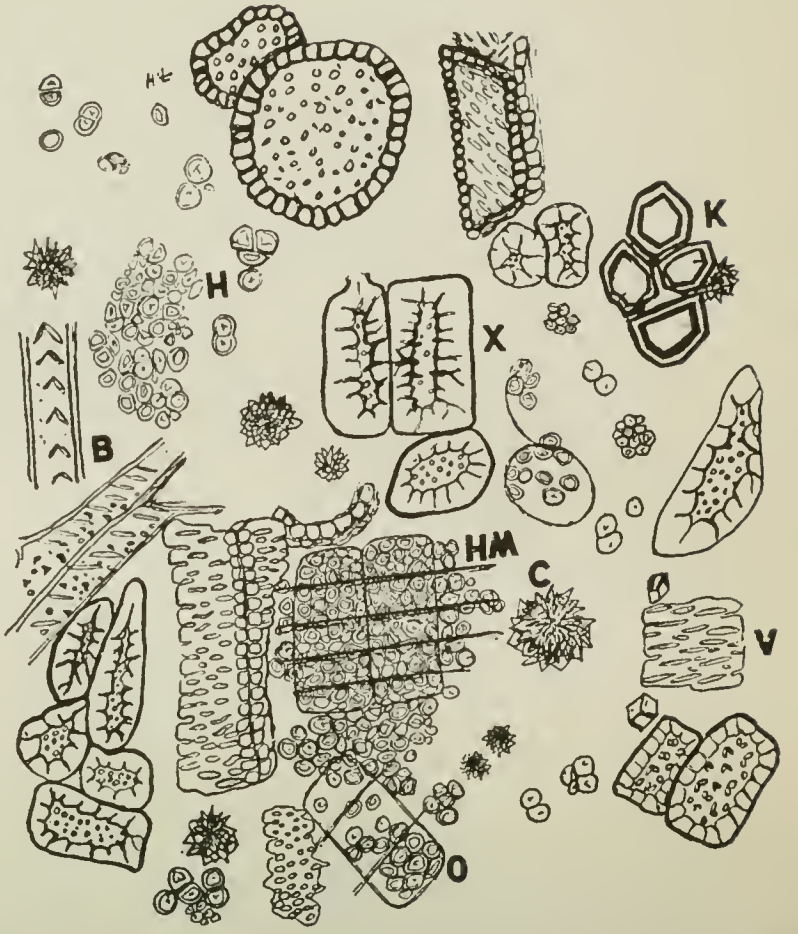
The microscopical appearances of the three drugs in powder form are illustrated and the article is concluded by comparisons of histological structures and gross characters in tabular form. Starch grains of A. tuberosa range up to 0.025 Mm., those of syriaca up to 0.035 Mm., and those of decumbens up to 0.060 Mm. Crys-

Fig. 22.



Asclepias Structure.

Fig. 23.



Asclepias Structure.

tals occurring in tuberosa are mostly cubical, in syriaca mostly rosette and in decumbens cubical and rosette in equal amounts. The chief difference in gross characters is color and appearance of the outer surface.—C. U. C. P. Al. J., 23 (1916), 154. (C. W. B.)

Beesia.—*A New Genus.*—A new genus of Ranunculaceæ named Beesia in honor of Bees, Ltd., to whose enterprise much botanical exploration in China, Burma and the Himalayas has been due, has been described, states "Nature," by Bayley Balfour and W. E. Smith, in "Notes from the Royal Botanic Garden, Edinburgh." The new plant, Beesia cordata, is allied to the Japanese genus Glaucidium and to the Japanese and American Hydrastis. It was collected by F. Kingdon Ward in Northern Burma, at 9,000 feet altitude, in deep forest shade.—Chem. and Drug., 88 (1916), 70. (K. S. B.)

Belladonna.—*Improving Quality through Selection.*—A. F. Sievers reports a carefully conducted investigation of belladonna cultivation under the auspices of the Department of Agriculture. Starting in 1910, 24 belladonna plants were studied, the leaves of each being submitted to assay and the results obtained ranged from 0.334 to 0.700 per cent. of alkaloids. In 1911 and 1912 the original 24 and 35 additional plants were studied, pickings, two in May, one in June, one in September and one in October, being made, and the leaves from each plant were assayed separately. The alkaloidal content of the 59 plants in 1911 ranged from 0.306 to 0.766 per cent., and in 1912 from 0.401 to 0.768 per cent. It was also found that the highest yield occurred in the September picking.

A comparison of the appearance of the plant and the alkaloidal content of its leaves gave no concordant results. Thus one of the most handsome plants had leaves containing only 0.536 per cent. of alkaloids, while an insignificant plant had leaves with an alkaloidal content of 0.657 per cent. Soil and climatic conditions appear to have only small influence in alkaloidal production, since all of the plants studied were in the same plot. Apparently variation in alkaloidal production is dependent on the individual plant rather than on environment.

Selecting typical low alkaloidal and high alkaloidal plants, Sievers propagated them to the first generation. While the offspring of the poor quality plants showed higher alkaloidal content than the parents, their percentages were still low. Those emanating from high quality parents were distinctly increased in strength, one parent having leaves containing 0.768 per cent. of alkaloids yielding an offspring that contained 1.043 per cent. of alkaloids.

Comparative experiments in close- and cross-pollination were tried without striking results, since, contrary to expectations, close-pollinated plants were not much richer in alkaloids than were the cross-pollinated specimens.

The second generation plants were cultivated at three places, Arlington, Va., Timmonsville, S. C., and Madison, Wis. Even in these three widely separated localities the second-generation plants ranged themselves largely in the same order as the original selected parents. The South Carolina plants averaged more alkaloid than did the Wisconsin plants; while the Arlington plants were the lowest of the three.

Propagation by cuttings was tried. The results failed to show any practical advantage over propagation through seed.—Am. J. Pharm., 88 (1916), 193.

Belladonna and Hyoscyamus Leaves.—*Evaluation.*—The Beuttner method which was included in the fourth edition of the Swiss Pharmacopœia is recommended by Johannessen, especially with the change to extract the leaves with weak hydrochloric acid instead of with alcohol, thus avoiding solution of the chlorophyll. This is accomplished as follows: 15 Gm. powdered leaves are macerated during 24 hours with 145 mils 0.1 per cent. hydrochloric acid. After filtering through a folded filter 60 mils of the filtrate (= 6.0 Gm. leaves) are evaporated on a water-bath to about 5 mils. This is run by the aid of 7 mils water into a bottle and further treated according to Ph. Helv. IV except that iodeosin is used as indicator. By extracting with water instead of with alcohol a titration and several weighings are avoided; however, the evaporation takes place more slowly.

According to the investigations of the author, the method of Ph. Helv. IV and the foregoing (water) method are best; the method of Cæsar and Loretz is also good if a person is acquainted with it. The method of the German Arzneibuch is involved and inexact and that of the Norwegian Pharmacopœia is to be condemned. The author also investigated the evaluation of the extracts. Farmaceutisk Titende; through Pharm. Ztg., 61 (1916), 116.

Belladonna.—*Cultivation in England.*—Information concerning the cultivation of belladonna in waste lands is given by J. Beetham Wilson.—Chem. and Drug., 88 (1916), 772. (K. S. B.)

Belladonna.—*Cultivation near Petrograd.*—According to Vaytte, belladonna has been successfully cultivated in the neighborhood

of Petrograd since 1914, and already good crops have been obtained. The leaves of the Russian plant gave 53.1 per cent. of dry product, the stems 46.8 per cent. The dried leaves gave 28.23 per cent. of extract, which yielded 2.109 per cent. of hyoscyamine. The stems yielded 20 per cent. of extract, which contained 1.6 per cent. of hyoscyamine. The extract from the entire plant gave 1.878 per cent. of that alkaloid. In view of the considerable quantity of alkaloid present in the stem, it is recommended that the whole plant should be utilized for its preparation. The optical rotation of the alkaloid from the stems and leaves was practically identical, $[\alpha]_D$ +22° 12′ and +22° 18′. Its melting point was 110 to 111° C. This hyoscyamine was converted into optically inactive atropine, melting at 115° C., by twenty-four hours' contact, in alcohol, with a 0.25 per cent. caustic soda solution. It seems that the original alkaloid of cultivated belladonna is wholly hyoscyamine, and does not contain more than traces of atropine. In consequence of the success that has attended the cultivation of belladonna in Russia, it will no longer be needful to employ scopola or other German drugs for the preparation of mydriatic alkaloids.—J. pharm. chim.; though Pharm. J., 97 (1916), 251.

Benzoin.—*Source of Siam.*—According to the investigations of E. M. Holmes, its source is Styrax Tonkinense. The plant is found to grow in the territory between Luang Probang and Hanoi. He further states that Styrax benzoides, found in northwestern Siam, yields an aromatic resin, which is used chiefly by the natives, and is not generally found in commerce. Saigon benzoin, which only recently has found its way to the English market, possesses a vanilla-like odor, similar to that of Siam benzoin, and is free from cinnamic acid. Holmes inclines to the belief that its source is the Styrax Tonkinense. Its rough exterior and its general appearance reminds one of Sumatra benzoin. From Indo-China, only one member of the family yielding benzoin, namely Styrax agresta, is contributed. Holmes states that he does not know whether or not benzoin from this source reaches the markets.—Pharm. J.; through C. U. C. P. Al. J., 23 (1916), 202. (G. C. D.)

Two years ago Herr Rordorff, an apotheker at Basel, published a description of the leaves, twigs and bark of the Siam benzoin tree. This year he received through his brother-in-law, the Dutch Minister at Bangkok, specimens of the fruit of the tree, or what he believes to be such, and he now gives an illustration and description of it. The fruit, in size and shape, closely resem-

bles that of Styrax benzoin, but the illustration given shows that it does not possess the characteristic persistent calyx of Styrax, a fact which is pointed out by Herr Rordorff himself; and the epicarp contains an orange-red resin, while that of Siam benzoin is milky white. These two features alone, without taking into consideration the small size of the embryo, and the bitter taste of the odorless seed, indicate that there is a mistake somewhere. It seems to be the opinion of those in England who have seen the illustration of the fruit that the fruit is not that of a Styrax at all, but of some other plant belonging probably to the Sapindaceæ, and that the wrong fruit has been purposely supplied by the natives. Unfortunately, Herr Rordorff has proposed the name of Styrax Siamensis for the tree bearing the fruit. Until, therefore, more satisfactory evidence is forthcoming, it will be safer to regard the source of Siam benzoin as Styrax Tonkinense, as pointed out above.—Schweiz. Apoth. Ztg.; through Pharm. J., 97 (1916), 523.

Benzoin.—*Historic Sample of.*—Fanchon Hart gives an interesting account of a sample of Palenbang benzoin originally shipped in 1691 and now in the drug museum of Columbia University College of Pharmacy. The vessel transporting the shipment was wrecked in Table Bay and the cargo accidentally recovered about 1885. A brief historical account of gum benzoin forms part of the article and there is a photograph of the above sample.—C. U. C. P. Al. J., 23 (1916), 53. (C. W. B.)

Cacao.—*Fat Assay of.*—W. Lange proposes the following method of fat extraction taking one-half to three-quarters of an hour instead of the 24 hours demanded by the usual Soxhlet procedure: A wide-mouthed flask, of about 250 mils capacity, is fitted with a rubber stopper with two perforations. Through one of these a tube connects with a water pump, and in the other a filter tube of from 3.5 to 4 Cm. diameter is fitted. Inside of the filter tube, a Witt's filter plate, with perforations of $^3/_4$ to 1 Mm. in diameter, is fitted. A layer of asbestos 3 to 4 Cm. in thickness covers the filter plate. Before the extraction of the sample is attempted, water is drawn through the asbestos layer, by means of the water pump, until particles of asbestos cease to pass through. From 5 to 10 grammes of cacao powder or grated chocolate are then placed on the asbestos layer, the surface being made smooth by means of a glass rod. From 10 to 15 mils of ether are poured on the sample being extracted and the tube covered with a watch

glass. When the ether begins to percolate through the chocolate layer, suction is carefully applied. The same operation is repeated until 100 mils of ether have been employed, using this in quantities of from 5 to 10 mils at a time. Another flask is then attached and the extraction allowed to continue until another 50 mils of the solvent have been employed. The combined ether extracts are then vaporized, and the residue thus obtained dried to constant weight at the lowest possible temperature. The quantity of fat extracted from nine samples examined ranged from 50.9 to 57.3 per cent.—Chem. Ztg.; through C. U. C. P. Al. J., 23 (1916), 220. (G. C. D.)

Cacao.— *Volatile Oil in.*—S. H. Davis and J. S. Bainbridge made investigations concerning the volatile-oil content of cacao beans. From 2 kilos of the beans, by steam distillation, they succeeded in obtaining 24 mils of volatile oil. This, upon examination, was found to consist chiefly of *d*-linalool. The presence of a fatty acid and a very small amount of a nitrogenous body was also ascertained.—C. U. C. P. Al. J., 23 (1916), 12. (G. C. D.)

Calotropis Gigantea.—*Root-Bark of.*—E. G. Hill and A. P. Sirkar have investigated the constituents of this bark, and obtained the following from 4 kilos: An oily substance, 78 grammes; a white solid, 90.5 grammes; a substance like guttapercha, 330.5 grammes; and a small quantity of a yellow bitter substance (which gave alkaloidal reactions, but nothing more definite). The oily substance was found to consist of the guttapercha-like solid (but not guttapercha). The white solid was fractionally separated from hot alcohol into (*a*) white nodular crystals, melting at 140°, which proved to consist of the isovaleric ester of a new alcohol, $C_{30}H_{47}O.OH$, to which the name *mudarol* was assigned; and (*b*) white acicular crystals, melting at 210°, which were found to consist of the isovaleric ester of an alcohol, $C_{38}H_{61}O.OH$, to which the authors give the name akundarol.—J. Chem. Soc.; through Pract. Drug., Mar., 1916, 39.

Caltha Palustris.—*Constituents of.*—Poulsson believes that the toxic properties of Caltha palustris, or marsh marigold, are due to the presence of volatile substances, like anemonin, anemon-camphor, etc., which are present in many other ranunculaceous plants. He did not succeed in isolating these substances since they are present only in small quantities, but he could isolate choline, of

which the fresh plant contains from 0.5 to 1.0 per cent.—Arch. exp. Path. Pharm.; through Pharm. Weekblad, 53 (1916), 1602. (H. E.)

Carnauba Wax.—*Exports from Brazil.*—The exports of Carnauba wax from Brazil during the year 1915 amounted to 5,897,378 kilos, against 3,315,693 kilos in 1914.—Chem. and Drug., 88 (1916), 973. (K. S. B.)

Cannabis.—*Biological Standardization of.*—W. A. Pearson commends the introduction of an animal assay of cannabis in U. S. P. IX and only regrets that in the case of other drugs, physiological assays were made optional instead of compulsory. He discusses the relative susceptibility of dogs to cannabis, describing a small fox terrier that he has used as test animal for five years, stating that he is as sensitive to the action of cannabis now as he was five years ago. He has tried to breed susceptible animals from this sire, with some success.

Pearson expresses the wish that a standard fluidextract of cannabis be prepared, similar to the standard anti-diphtheritic serum, prepared by Dr. Anderson, of the government service; this standard to be furnished as norm to all workers in cannabis assays.—J. Am. Pharm. Assoc., 5 (1916), 1194.

Capsicum Annuum.—*Pigments of.*—Alkins and Sheppard state that the colors of capsicum fruits are due to pigments located in plastids contained in the epidermis as well as in the deeper tissues. The difference in the depth of color seems to be due to the size and thickness of the cell wall, and to variations in packing with chromatophores. A peroxidase ferment is most active in the unripe fruit, and is probably connected with the change of color which occurs in ripening. The action of the oxidases in the ripe fruit is largely checked by inhibitors developed in the epidermis and in all underlying cells. The age of the fruit seems to be the most important factor in deciding the degree of activity of the oxidases, although the color also varies with this. No positive indication of the presence of tyrosinase was obtained. The solubility of the pigments in different organic solvents was determined. It was found that upon sufficient dilution the colors usually approached each other, almost matching, thus proving that the pigments of an individual color were not mixtures.—Sci. Proc. Roy. Dub. Soc.; through Pharm. J., 96 (1916), 371.

Castor Oil Plant.—*Commercial Cultivation of.*—At the meeting of the Pennsylvania Pharmaceutical Association, J. L. Lemberger pleaded for a revival of the commercial cultivation of castor oil seed in this country, publishing letters from oil pressers, showing that practically their entire stock of seed came from India. He quotes Procter's account of the castor oil seed cultivation as practiced in Illinois in 1855 and expresses his belief that the seed would prove a profitable crop to the American farmer.—Pharm. Era, 49 (1916), 426.

Cestrum Parqui.—This is a shrub, found widely distributed in the countries of South America, more especially in the central provinces of Chili. The natives employ an extract of this plant as a remedy against tropical fevers, and as a diaphoretic. J. Mercier and J. Chevalier have investigated this plant along botanical, chemical and physiological lines, using the plant as obtained from its natural source and specimens obtained from the Museum of Paris, and report the presence of an alkaloid, which they have named parquine, and a glucoside, concerning which the chemical examination is not yet complete. They give the following formula for parquine: $C_{21}H_{39}NO_8$. The taste of the alkaloid is exceedingly bitter, resembling that of strychnine. It is insoluble in water, petroleum ether and benzene, sparingly soluble in ether, but readily soluble in alcohol and chloroform. Its melting point lies between 180 and 181° C. The aqueous solutions of the salts of parquine are unstable, becoming colored deeply yellow in a short time.—C. W. C. P. Al. J., 23 (1916), 167. (G. C. D.)

Cetraria and Chondrus.—*Use in Pharmaceuticals.*—Piorkowski recommends the use of Irish and Iceland moss in emulsions, and as substitutes for salve bases, cold creams, soap and glycerin. Their mucilages reduce the bitter taste in certain drugs, notably the laxatives.—Ber. pharm. Ges., 26 (1916), 192; through Chem. Abstracts (1917).

Cetraria Species.—*Use as Food.*—O. Hesse discusses the possibility of using native lichens as substitutes for foodstuffs or fodder. Iceland moss gelatin, in the form of jellies, flavored with chocolate or other flavors, cannot be distinguished from those made with sago or with agar-agar. Cetraria nivalis is also recommended as a cheap and pleasant flavored article of food. Cetraria islandica in the air-dry condition contains about 80 per cent. of carbohydrates

and from 13 to 14 per cent. of water. The bitter taste is removed by preliminary treatment with cold 1 : 100 potassium carbonate solution.—J. prakt. Chem.; through Pharm. J., 97 (1916), 297.

Chaparro Amargosa.—*Use in Amœbic Dysentery.*—Dr. P. I. Nixon, of San Antonio, Texas, has found that an infusion of Chaparro amargosa taken by the mouth, accompanied by the rectal injection of a quart of the infusion once a day, is very effective in dysentery. In a case reported in the present paper a complete cure was effected, after eight months of emetine treatment had proven unavailing.—J. Am. Med. Assoc.; through J. Am. Pharm. Assoc., 5 (1916), 608.

Chaulmoogra Oil.—*Use in Leprosy.*—The intravenous injection of chaulmoogra oil emulsified with acacia and sterilized at 110° C. has given encouraging results in the treatment of leprosy.—Chem. and Drug., 88 (1916), 69. (K. S. B.)

Chaulmoogra Oils.—*Acids of.*—Rakuzin and Flier, noting that the oils obtained from Gynocardia odorata, Taraktogenos kurzii, Gynocardia prainii, and several varieties of Hydnocarpus are indiscriminately sold under the name of chaulmoogra oil, and that Ostromuislenskii and Bergman consider oleum chaulmoograe and oleum gynocardiæ identical, compared all the available literature data on these oils. These show that the two last-named oils are not identical, and that most probably only the optically active chaulmoogra oil and chaulmoogra acid are of medicinal value.—J. Russ. Phys.-Chem. Soc.; through Drug. Circ., 60 (1916), 750.

Chaulmoogra Oil.—*Source of the False Variety.*—H. C. Brill discusses the obscurity enveloping the source of chaulmoogra oil of commerce. In Malabar, the oil from the seeds of Hydnocarpus venenata is known as "Kaveltel," and this oil is known as false chaulmoogra in many plants. It is so similar to the genuine oil from Taraktogenos kurzii that a chemical distinction is hardly possible. In fact the author claims that taraktogenos and hydnocarpus oil are physiologically identical, but that the oil from Gynocardia odorata may be different. Brill, in his paper, tabulates the constituents of the various chaulmoogra oils.—Philippine J. Sci.; through Chem. Abstracts, 10 (1916), 2783.

Cinnamon.—*Cinnamic Aldehyde Assay.*—Fellenberg recommends the following method: One gramme of the powdered bark is heated with 40 mils of alcohol for ten minutes in a flask provided

with a reflux condenser. The alcohol is distilled until 30 to 35 mils of distillate are obtained, and after adding 100 mils of water to the flask the distillation is continued until the distillate measures 100 mils. Five mils of the distillate are mixed with 2 mils of a 5 per cent. alcoholic solution of isobutyl alcohol and 3 mils of 38 per cent. alcohol. Then 20 mils of concentrated sulphuric acid are allowed to act on the mixture for 45 minutes. The color produced in the liquid is estimated colorimetrically, using a 2 per cent. solution of cinnamic aldehyde in 38 per cent. alcohol, treated as given above, for comparison. The amount of cinnamic aldehyde in nine samples of Ceylon cinnamon varied from 1.3 to 1.8 per cent., and in seven samples of Chinese cinnamon from 1.25 to 2.77 per cent. One sample of cinnamon flowers assayed 3.73 per cent. aldehyde.—Rep. pharm.; through Drug. Circ., 60 (1916), 755.

Cinchona.—*Alkaloidal Assay of.*—Lenci estimates the cinchona alkaloids by precipitation with an excess of picric acid, and residual titration of the excess of picric acid with nitron. The alkaloids are estimated by calculation of the amount of picric acid combined.—Chem. and Drug., 88 (1916), 40. (K. S. B.)

Colchicum Seed.—*Glucose Content of.*—These seeds contain a copper-reducing sugar, which cause variation in the amount of extractive in a tincture prepared from them. Umney reports that the amount of glucose found by him in commercial samples ranged from 1.7 to 5 per cent. A sample picked by E. M. Holmes from the first fruit was found by Umney to contain 5.38 per cent. of glucose. The variation is due to the dryness or dampness of the season or to the influence of the ripening of the colchicum fruit.—Drug. Circ., 60 (1916), 18.

Cotton Seed.—*Changes during Storage.*—J. B. Rather reports on some very interesting observations as follows: A 5,000 pound lot of dry-harvested cotton seed was stored in a pile measuring 12 feet by 12 feet by 6 feet. The mass was kept in this manner for 77 days. During intervals samples taken from different parts of the mass were analyzed and the temperature in different parts of the mass observed. It was found that the moisture content fell from 13.77 to 10.94 per cent., and that the mass became heated, the highest temperature noted being 43° C. Perhaps the most important changes noted are the increase in free fatty acids and total acidity. In order to make certain that these latter changes were due to the increased temperature, experiments were made with

cotton seed heated and stored in air-tight containers. From these it was demonstrated that even a short period of heating will result in the hydrolysis of no less than 10 per cent. of the fatty matter of cotton seed. Longer periods of heating or a long-continued storage of heated seed will result in the hydrolysis of as much as 70 per cent. of the oil contained in the seed. 33 per cent. of the protein was also hydrolyzed and the total acidity rose to seven times its normal amount. The author stated that cotton seed of this kind is practically valueless, except for use as a fertilizer and for the manufacture of certain kinds of soap. It was also established that the increase in acidity noted was not due to length of storage, but rather to the heating which resulted. Samples taken from parts of the mass which had not become heated were found to possess normal values.—J. Ind. Eng. Chem.; through C. U. C. P. Al. J., 23 (1916), 233. (G. C. D.)

Cumin.—*Adulteration.*—A grass seed known as seenk seed is extensively used to adulterate cumin. Agra imported 9510 maunds of seenk seed during the official year 1915-16.—Chem. and Drug., 88 (1916), 872. (K. S. B.)

Dandelion.—*History of.*—The name is derived from "dent de lion," *i. e.*, "lion's tooth," as the leaves are supposed to resemble the teeth of a lion. It is a native of the Himalayas and was brought to western Europe by the Greeks and Romans. The celebrated botanist Linnæus selected the dandelion as a part of his floral clock, for its bright yellow flowers open in the morning between 5 and 6 A.M. and close in the evening between 8 and 9 P.M.—Sc. Am. Suppl., 1916, No. 2106. (O. R.)

Daffodil Bulbs.—*Toxicity of.*—Poisoning of a family through partaking of soup in which daffodil bulbs had been used in mistake for onions is noted by W. G. McNab. Violent sickness, vomiting and diarrhea were produced with salivation lasting several hours. —Chem. and Drug., 88 (1916), 44. (K. S. B.)

Digitalis Assays.—*Comparative Value of Different Methods.*—J. W. Hamner describes his work on two methods for standardizing digitalis. Those of Focke and Gottlieb are described. The latter is chosen for the work because of the difficulty in obtaining frogs (Rana temporaria) of the prescribed size. The standard for the work was a 10 per cent. infusion of digitalis whose strength was determined by the method of Focke to be $V = 4.4$. The minimum dose of this standard to produce death in systole of the frog's

heart in the prescribed time is 1.43 Mg. Counting this as 100 per cent. the values for the preparations studied may be summed as: digitotal *per os* 100.7, injected 104.8; digalen *per os* 190.9, injected 232.8; digifolin 94.4; digitalisatum Bürger 101.4; digitalis-dialysatum Golz 189.5. The discrepancy between the amounts as determined and those which should theoretically be present were in some cases very large, ranging from +4.2 per cent. for digitotal to —208.4 per cent. for digalen.—Svensk Farm. Tidskrift; through Chem. Abstracts, 10 (1916), 2276.

Digitalis.—*Assay of Preparations of.*—G. B. Roth assayed various digitalis preparations by the one-hour frog method and found a variation of over 250 per cent. in 13 samples of fat-free digitalis and 150 per cent. in 5 samples of commercial (German) digitalin. He found no difference in qualitative effects on the dog between a fat-free and and official tincture of digitalis.—Hygienic Lab. Bull.; through Am. J. Pharm., 88 (1916), 258.

Digitalis.—*New Biological Assay.*—W. H. Zeigler recommends the use of turtles as test animals in the physiological assay of digitalis. He points out the difficulty in such assays due to the several ingredients of digitalis having conflicting action; he believes that the minimum systolic dose method of the Pharmacopœia is unsatisfactory since toxic value is by no means a true index of therapeutic value; he is of the opinion that marketed preparations would not show the reported variations, if a uniform method and a uniform solvent had been employed in all of the tests recorded.

He describes his turtle method at some length, claiming for it, that the animal is not subject to climatic conditions; that it is easily procured and kept; that the dose is dependent on body weight and that the animal can be used to record both therapeutic and toxic effect. He finds that when the heart lever of the recording apparatus is attached to apex of the heart by means of a string, a three-minute record of digitalis action may be obtained while cessation of heart contraction occurs in about ten minutes.—J. Am. Pharm. Assoc., 5 (1916), 1188.

Digitalis Preparations.—*Value of Proprietary Forms.*—The Council on Pharmacy and Chemistry reports that it is becoming increasingly apparent that the tincture of digitalis produces the full therapeutic effects of digitalis, and that when it is properly made it is as stable as any liquid preparation of digitalis now available; and

that the tincture has the systemic side actions of digitalis, including the emetic, in no greater degree than the various proprietary preparations of this drug. Strophanthin and crystallized ouabain are now available in sterile solutions in ampuls and afford a convenient means of promptly securing the cardiac action by intramuscular or intravenous injection.—J. Am. Med. Assoc., 67 (1916), 2024. (W. A. P.)

Digitalis.—*Standardization and Potency of American-Grown.*—Rowntree and Macht have compared the various biological digitalis assays and prefer the Hatcher cat method. They find American-grown digitalis has a high degree of activity.—J. Am. Med. Assoc., 66 (1916), 870.

Digitalis Ambigua.—*Substitution for Official Digitalis.*—Researches conducted in the Pharmacognostic Institute of the Vienna University by R. Wasicky indicate that Digitalis ambigua is an acceptable substitute for Digitalis purpurea. The leaves contain 0.31 per cent. of digitoxin, and he claims that there is no difference in the activity of the red and yellow flowered varieties.—Z. allgem. œsterr. Apoth.-Ver.; through Chem. and Drug., 88 (1916), Supp. XXXVI. (K. S. B.)

Elderberries.—Van der Wielen states that these are used in Holland for the preparation of a jelly and a syrup. According to the formula of the Dutch Pharmacopœia, the rob sambuci should be made from the ripe berries. He remarks, however, that berries which are not entirely ripe yield a jelly of a much better color.—Chem. and Drug., 88 (1916), 911.

Elderberry Juice.—*Use in Neuralgia.*—Epstein and others have previously reported the cure of neuralgia with port wine and elderberry juice or with the juice and a mixture of alcohol of the strength of port wine. Jokl has tested the action of this remedy in about sixty cases in Jaksch's clinic, in Prague. The results are stated to prove that in true idiopathic neuralgia, which is a relatively rare affection, the treatment was useful. In about one-third of the cases treated the effect was markedly beneficial. When this did not occur in a couple of days the administration was abandoned. It was, as a rule, valueless in traumatic and inflammatory lesions of the nerves, in sciatica due to constipation, and in trigeminal neuralgia arising from disease of the teeth or jaws. In genuine neuritis the pain was increased by the juice, so that it affords a valuable test of an inflammatory process. The beneficial effects

were most pronounced in primary neuralgia, particularly that of the trigeminal and sciatic nerves. As it is not possible to distinguish beforehand between cases that react favorably and unfavorably to the treatment, a guarded prognosis should be given. The juice may cure a first attack, but have no effect on a relapse. H. S. Vetlesen confirms these statements, and instances cases of cures, and others in which no benefit was derived. The dose recommended is 30 Gm. of elderberry juice mixed with 10 Gm. of port wine.—Med. Review; through Pharm. J., 96 (1916), 643.

Erodium Cicutarium.—*A Substitute for Hydrastis Canadensis.*—Erodium cicutarium, a common wild plant in Holland, has been found by J. A. Von Dongen to be an excellent substitute for Hydrastis canadensis as a styptic in uterine hemorrhage. The plant has the advantages of being not poisonous, cheaper and more easily obtainable. A liquid spiritous extract and a soft extract (30 parts representing 100 parts of the herb) were employed in the experiments. Von Dongen says that the hemostatic properties cannot be attributed to tannins.—Chem. and Drug., 88 (1916), 41. (K. S. B.)

Fleaseed and Linseed.—*Use in Constipation.*—Kohnstamm and Oppenheimer call attention to the good results obtained with linseed and fleaseed (the seed of Plantago psyllium) in the treatment of constipation. The former are given in doses of 2 to 5 tablespoonfuls, the latter in doses of 2 to 4 teaspoonfuls once or twice a day. The seeds, being perfectly tasteless, are easily taken by the patient. The action of the seeds depends on their properties of swelling up when coming in contact with liquids, due to the large amount of mucilaginous matter which they contain. The volume of linseed, when placed into a liquid prepared from a physiological salt solution (a 0.1 per cent. hydrochloric acid, and a 0.1 per cent. sodium bicarbonate solution), is increased 2.7 times, that of fleaseed 3.4 to 4 times. The action of the seeds, which are non-irritating, and consequently do not produce diarrhea, is therefore similar to that of agar.—Therap. Gegenw.; through Drug. Circ., 60 (1916), 18.

Flour.—*Nitrogen Dioxide in.*—K. Scheringa has examined a great many samples of flour bleached by Alsop's process for nitrogen dioxide by mixing 5 Gm. of the flour with 15 mils of distilled water and 2 mils of Griess' reagent and comparing the color produced with that produced in pure flour to which a known amount of nitrogen dioxide had been added. He arrives at the conclusion that unbleached flour is liable to absorb nitrogen dioxide from the air

and always contains an appreciable amount of nitrogen; that freshly ground flour rarely contains nitrogen dioxide; that Griess' process is very convenient for detecting nitrogen dioxide in flour; finally that bleaching flour with the aid of nitrogen dioxide gives a product which is not at all harmless to man. F. A. Steensma, on the other hand, states that by bleaching flour with nitrogen dioxide some of the vitamines might be rendered physiologically inactive but that the small quantities of nitrogen dioxide retained in the flour are not harmful to health.—Pharm. Weekblad, 53 (1916), 945 and 955.

Frangula.—*Alnus Bark as Substitute for.*—Tunmann examined a small sample of bark offered as Rhamnus Carniolica, to be used as a substitute for R. frangula. The drug was found to be genuine, but a later shipment contained only 15 per cent. of R. Carniolica, while the rest was Alnus glutinosa. However, it could be ascertained that R. Carniolica will afford a very valuable substitute for buckthorn bark, as it contains a large amount—over 3 per cent.—of anthraquinone derivatives, entirely similar to those from frangula and cascara. Many anatomical points of difference and resemblance are given, for which one must refer to the original. The new drug grows largely in middle and southern Europe, Central Asia and China. The assay of drugs containing anthraquinone derivatives is also discussed at length.—Schweiz. Apoth. Ztg.; through Pharm. Era, 49 (1916), 113.

Corean Ginseng.—*Constituents.*—According to Kondo and Tanaka, ginseng yields 47.66 per cent. of aqueous extract, 25.66 per cent. of methyl alcohol extract, and 0.68 per cent. of ether extract. The aqueous extract contains a substance which gives mucic acid on oxidation. The ether extract consists of a volatile oil, and a mixture of phytosterol and an amorphous acid. The alcohol extract yields sucrose, a small amount of nitrogenous substance, and a saponin.—J. pharm. chim.; through Pharm. Era, 49 (1916), 113.

Glycyrrhiza and Its Extract.—*Constituents of.*—The first part of an article on this subject by Percy A. Houseman appeared in the "American Journal of Pharmacy" in 1912 (page 531). In the second part here abstracted the author records his experiments—additional and confirmatory—undertaken with the view of improving his method of analysis but finds that no decided changes in the method previously given would be advantageous. The separation of the glycyrrhizin from the starch and gums was effected with 75 per

cent. alcohol in place of 80 per cent. as it was found that the latter precipitated small quantities of glycyrrhizin in some cases.

Partly because of imperfections in methods of analysis and partly because of uncertainty of composition of pure licorice root and extracts it has as yet been impossible to establish accurate chemical standards of purity for these substances.

The following method of separating cane sugar from licorice root has been worked out by Houseman: Ground Russian root is macerated with 5 per cent. H_2SO_4. Three liquors are collected, mixed, centrifuged, neutralized with sodium hydroxide, boiled and filtered free from albumin. The filtrate is evaporated *in vacuo* to small volume and treated with six times its volumes of 95 per cent. alcohol. Remove starch, gum and precipitated sodium sulphate by filtration and again evaporate clear brown solution to small volume *in vacuo*. Boil this liquid with concentrated strontium hydroxide solution for one-half hour. Filter off precipitated strontium sucrate while hot and boil filtrate again with strontium hydroxide. Remove strontium from precipitate by suspending in water into which carbon dioxide is passed. The light yellow filtrate is evaporated to a syrup and crystallized from boiling 95 per cent. alcohol.

Houseman believes that the biologically active saponins of licorice root are in the inner bark and that besides an active saponin a sapogenin is contained in the root.

Experiments with purified glycyrrhizin seem to indicate presence of nitrogen to the extent of 1.89 per cent. in spite of the generally accepted idea that there is no nitrogen in its composition.

Glycyrrhizin purified with acetic acid produces no immediate precipitate with double normal sulphuric acid, whereas glycyrrhizin not thus purified is precipitated by very dilute sulphuric acid. Pure glycyrrhizic acid absorbs bromine in the cold, but gives no precipitate. Impure glycyrrhizin or an aqueous solution of licorice extract gives an immediate precipitate with bromine even in dilute solution.

Oxidation of glycyrrhizic acid with potassium permanganate yielded a white powder which is to be investigated further. Oxidation with nitric acid yielded a bitter-tasting yellow dye containing no picric acid.

A yellow dye which dyes silk a pale but fast yellow was obtained by percolating licorice root with hot water, evaporating to dryness, extracting with absolute alcohol, evaporating to dryness and extracting with hot water. A summary of some recent extractions

of licorice root with ether and varying strengths of alcohol is given and these agree fairly well with previously reported results.—Am. J. Pharm., 88 (1916), 97. (R. P. F.)

Glycyrrhiza and Its Extract.—*Glycyrrhizin Assay of.*—A. Linz reports a careful study of 27 suggested methods of glycyrrhizin assay, his paper having a remarkable bibliography of the subject. He finds that the assay of licorice root can best be done by the method proposed by Houseman (see page 194). For the extract he recommends the following: Five grammes of the extract are softened by warming with 50 grammes of water, the mixture is cooled, 100 mils 95 per cent. alcohol are added, the mixture macerated for six hours, then filtered, 60 per cent. alcohol being used to wash the residue on the filter. The filtrate and washings are concentrated to 30 mils, then diluted to 50 mils, 5 mils of sulphuric acid are added and the mixture chilled on ice for 24 hours. The precipitate is collected on a filter, washed with 2 per cent. sulphuric acid, then with water saturated with ether and the filter and its contents dried over concentrated sulphuric acid. The glycyrrhizic acid on the filter is dissolved in successive portions of hot 95 per cent. alcohol, the alcoholic solutions evaporated to dryness and weighed. There still remains some glycyrrhizin in the mother liquid left after the precipitation with sulphuric acid and this is recovered by saturating it with ammonia, evaporating to a thick syrup, diluting to 18 mils, adding 2 mils of diluted sulphuric acid, chilling on ice, collecting the precipitate on a filter, washing with 2 per cent. sulphuric acid and then with water saturated with ether, extracting with 95 per cent. alcohol, evaporating the alcoholic solution and finally weighing. The weight of this residue, together with the main mass of glycyrrhizic acid obtained by the first precipitation, gives the glycyrrhizin content of the extract, which in good qualities runs from 9.98 to 10.55 per cent.—Arch. Pharm., 254 (1916), 134; through Chem. Abstracts (1917).

Grape Juice.—*Concentration by Freezing.*—This new method has been developed by the U. S. Department of Agriculture and takes the place of boiling the juice. By freezing the juice one gallon can be concentrated to one quart. Another advantage is that the cream of tartar crystallizes out with the ice and thereby reduces the acidity of the grape juice. Besides this the natural purple color of the juice is also preserved. After concentration by freezing, the juice is sterilized by heat and it will keep indefinitely.—Sc. Am., August 14, 1916, 141. (O. R.)

Hashish.—*Tests for.*—The following test for hashish is given by William Beam in Bulletin No. 4 of the Chemical Section of the Wellcome Tropical Research Laboratories, Khartoum. The suspected material is extracted with petroleum ether of low boiling point, and which leaves no perceptible residue when evaporated in the cold. The petroleum-ether extract is separated, filtered, and evaporated to dryness in a short test-tube. Both extraction and evaporation are carried on in the cold. To the residue is added a few mils of a reagent prepared by saturating absolute alcohol with dry hydrogen chloride gas. In the presence of cannabis extract the liquid strikes a bright cherry-red color which disappears on dilution with water or alcohol. Certain volatile oils, *e. g.*, origanum and santal, give a similar reaction, but the color is far less intense for similar amounts of material. Trials were made with a number of plant extracts and over 200 alkaloids, glucosides, etc., but in no case was a similar reaction obtained.—Chem. and Drug., 88 (1916), 46. (K. S. B.)

Hydrangea Tunbergii.—*Active Principle.*—Maniwa reports that the sweet principle of Hydrangea tunbergii is a lactone of the formula $C_{16}H_{14}O_5$. It contains two hydroxyl groups because it forms a diacetyl compound melting at 144°, and a dibenzoyl compound melting at 162°. The phenolic character of the product is shown both by the violet color which is produced when its solution is treated with ferric chloride and by its solubility in caustic alkalies. When fused with caustic alkali it yields pyrocatechuic acid and homosalicylic acid, $C_8H_8O_3$.—Yakugakuzasshi; through Drug. Circ. 60 (1916), 146.

Hyoscyamus.—*Quality of That Grown in Minnesota.*—At the meeting of the American Chemical Society, E. L. Newcomb and M. H. Haynes described their cultivation of hyoscyamus at the University of Minnesota. Assays by the method of U. S. P. IX showed that the laminæ only of the first basal leaves of biennial plants gave 0.0896 per cent. of total alkaloids. The petioles only, of the same, 0.0896 and 0.1012 per cent. The flowering tops of the annual plant 0.1561 and 0.1301 per cent. The flowering tops of Hyoscyamus pallidus gave 0.1301 and 0.1243 per cent. of total alkaloids. It is found necessary in Minnesota to germinate the seeds under glass. Biennial hyoscyamus seeds are found to germinate more satisfactorily if first treated with strong sulphuric acid. The seeds are placed in a porcelain dish, the acid poured on them, and

they are then stirred with a glass rod for two and a half minutes, then thrown on to a coarse screen, and thoroughly washed with water. Seed thus treated gives a fairly uniform germination in twelve to fifteen days. Untreated seed is very erratic in its germination. When planted out, after the last of the severe frosts, the plants are very subject to the depredations of the Colorado beetle, Doryphora decemlineata, in the United States. To protect them from this insect the application of Paris green, or some other arsenical insecticide, is necessary.—Am. J. Pharm., 88 (1916), 1.

Hyoscyamus Muticus.—*Hyoscyamine Content.*—J. H. Barnes states that Hyoscyamus muticus contains from 0.827 per cent. to 1.28 per cent. of hyoscyamine. As this is the only alkaloid present, he deems it superior to English henbane for the production of hyoscyamine.—Agricultural Journal of India; through Chem. and Drug., 88 (1916), 576. (K. S. B.)

Hughes found that Hyoscyamus muticus of Egyptian origin contained varying quantities of alkaloidal material at different times. Thus, if the plant parts be collected after ripening of the seed, only 0.60 per cent. of alkaloids was found, while if collected about the time of flowering, from 1.50 to 2 per cent. was obtained. He calls attention to the great care which must be taken in drying, stating that in an extract prepared from the plant parts carelessly dried, no alkaloids were obtainable, although vaporization was carried out under reduced pressure.—Bull. Tech. Sci. Service; through C. U. C. P. Al. J., 23 (1916), 232. (G. C. D.)

Ipecac.—*Criticism of Official Definition.*—The definition of ipecac appearing in the latest edition of the Pharmacopœia is claimed by H. H. Rusby to be a combination of errors. Brazilian and Carthagena ipecacs have been grouped under one title even though the yields of alkaloids and their therapeutic effects differ. Doubt is expressed that Panama ipecac is identical with the Carthagena variety. Brazilian ipecac should be named Evea ipecacuanha (Brotero), Standley, as this was the first designation applied to the plant subsequent to 1753. Studies by Dr. Rusby verify the validity of Karstens species Cephælis ipecacuanha as the source of the Carthagena article. The proper name for the latter and perhaps including the Panama variety, should be Evea acuminata (Karsten), Rusby. The generic name Cephælis may be restored if the arbitrary rule of starting nomenclature with 1753 is abrogated. The previous specification that stems, if present, be attached to the root, is a practical provision as the stem bases are rich in alkaloid.

It is claimed by the present Pharmacopœia that the question of stems, attached or detached, is immaterial because the drug must meet an alkaloidal requirement. The insincerity of this claim is proved by the limitation of stems to 5 per cent. Since detached stems are permitted, ipecac containing stems of plants of different origin but resembling those of Carthagena ipecac, has been imported. Alkaloidal standards may be met by such materials but the therapeutic action of these allied plants is unknown. The writer believes that the pharmacopœial ipecacs should be separated and appear under titles of "Ipecacuanha Brazilianensis" and "Ipecacuanha Carthagensis;" that stems not exceeding 10 Cm. in length, if attached, may be permitted and that the generic name Evea should be restored.—Drug. Circ., 60 (1916), 202. (C. W. B.)

Ipecac.—*Literature of.*—"The literature of ipecacuanha is voluminous, but I know it for the most part only at second hand," says Xrayser. The authors of "Pharmacographia" do not speak positively of the identity of the Igpecaya, or Pigaya, of Purchas' Pilgrimes with our drug, but there is no reasonable doubt of it. The actual first mention of this plant must have been a good deal earlier than 1625, since the writer cited for it left Brazil in 1600. Piso and Marcgraf, in their "Natural History of Brazil" (1648), describe and figure the plant, of which they knew two varieties. It was introduced into Europe in 1672 by a physician named Legras, who prescribed it so recklessly as to bring it into discredit; but fourteen years later a Parisian merchant, one Grenier or Garnier, brought it under the notice of Helvetius, as told by Wootton, with the result described in the Chronicles. Of the four varieties known to commerce in the early eighteenth century, the gray from Peru was at first preferred as the gentlest in operation, but the brown had the repute of being the most effective. It was supposed to come from Cartagena and New Granada. Ipecacuanha is rather a favorite name with our poets, to whom it appears to act as a challenge.

The name, according to Skeat, is compounded of the Brazilian *Ipé* = *peó* (small) *kaá* (plant) *guana* (causing sickness). The proper native name of the plant is *poaya*. Wine of ipecac first became official in 1746. The chief use of the drug formerly appears to have been for dysentery.—Chem. and Drug.; through Am. Drug., 64 (1916), 173.

Ixora Coccinea.—*Use as a Cholagogue.*—In the third report of the Indigenous Drugs Committee recently published at Calcutta,

the following seven drugs are reported upon: Rheum Emodi, Ixora coccinea, Melia Azadirachta, Holarrhena antidysenterica, Berberis Lycium, Symplocos racemosa, and Corchorus capsularis. Of these the largest space is devoted to Ixora coccinea. Although chiefly used in dysentery, in the treatment of which it comes second to ipecacuanha, it has the advantage of not producing nausea. It has a distinctly antiseptic action, improves the appetite and exercises a well-marked cholagogue effect, and relieves tormina and tenesmus. N. H. Ghosh is of opinion that Ixora is a drug of whose properties the profession ought to know more, and extend its trial further. As a cholagogue, which can be used when the bowels are loose, it certainly seems worthy of trial in this country.—Pharm. J., 97 (1916), 369.

Jalap.—*Some Characteristics of.*—O. Tunmann has run across a sample of powdered jalap adulterated with the seed-hulls of the palm, Attalea cohune. He has attempted to cultivate jalap at Berne but without success. The practical microchemistry of jalap is not a simple matter. Attempts to sublime beta-methylesculin out of the resin did not meet with success. Fatty acids can be detected only in the living tubers. Convolvulin can be detected with molybdo-sulphuric acid, which strikes a faint violet-red color in the cells containing the principle, while the parenchyme is only faintly yellow. In powdered jalap, zinc chloride is a useful convolvulin reagent, changing it to a brilliant yellow and then red. At 80° it is possible to extract one-third more resin from dried than from fresh tubers.—Apoth. Ztg., 31 (1916), 263, 267 and 273; through Chem. Abstracts (1917).

Kava-kava.—*Constituents of.*—S. Murakami says that an infusion of kava-kava is very poisonous to fish but that if the fish are removed to pure water, they are apt to recover. He does not agree with Winzheimer's findings that kava contains three times as much methysticin as yangonin. He finds more yangonin than methysticin.—Jour. Pharm. Soc. Japan; through J. pharm. chim., 14 (1916), 148.

Laminaria.—*A New Species.*—C. Sauvageau describes a new seaweed that appears to have established itself in the neighborhood of the French marine biological station at Roscoff. It has been named Laminaria Lejolisii, after the eminent French botanist, Le Jolis, who was an authority on Gallic seaweeds. It is a large plant with laminæ a meter or more long, bearing large, irregular sori,

fairly evenly distributed on both surfaces. A full description of the plant is given, indicating the distinctions between it and L. flexicaulis, L. cloustonii, and other allied species. How this new seaweed has been introduced to the coast of Brittany is not known. Probably its appearance is quite recent. It may have been brought by some vessel or even by a submarine. It appears to be well established and to be spreading. In this respect it differs from another introduced seaweed, Alaria esculenta, first noted in this locality about a century ago, which has shown no tendency to spread from the very restricted areas in which it was first noted. Since it grows more rapidly than L. cloustonii, it is possible that L. Lejolisii will supplant the latter, which is one of the richest in iodine among the European algæ.—Comptes rend.; through Pharm. J., 97 (1916), 615.

Lavender.—*Cultivation in England and France.*—V. Vivaudou calls to mind the part lavender played in the households of olden times and its use to-day by the modern perfumer. The most valuable oil is produced by English and French plants. The only species yielding a really aromatic oil is L. vera. Growing habits are discussed and it is found that warm sun, little moisture and stony, arid soil agree best with the plant. Judging by market values of the oil, cultivated plants are superior and the greatest center is in Hertfordshire, England. The soil is very dry, red, sandy loam and, although plowed frequently, no fertilizer is employed. Seed is sown in spring, afterwards being transplanted and set 12 inches apart in rows 3 feet distant from each other. By August the flowers are well developed and distillation is begun. French oil is usually obtained from wild plants. Owing to the laborers being anxious to increase the amount gathered, the bushes often suffer in the collecting process. The most common methods of distilling are crude and not conducive to the production of high-grade oil. For high yield the flowers must be fresh as they diminish in oil content very rapidly. Distillation over open flame is the plan most employed by small producers and the same distilling water is used many times over. The quantity of water and flowers must be carefully proportioned. Too little water causes scorching; too much causes loss of oil. Steam distillation is the better plan. The water used in distillation becomes a commercial article. Differences in distillation process and habitat of plants used cause marked differences in the oil. Hybrids of lavender and aspic produce an inferior oil.

Ester content calculated as linalyl acetate has been relied on in

the valuation of the oil. Although English oils are usually low in ester content (5–10 per cent.) they are preferred to French oils of high ester figure. The finest French oils are of yellow color with green tint, have a strong odor of the flowers, an aromatic slightly bitter taste and an ester content of 30–40 per cent. Rectified oils are nearly colorless but of inferior odor. Adulterated oils may be reinforced with many ethers to raise the ester content. Saponification, specific gravity, rotary power and solubility in 70 per cent. alcohol are relied upon in testing samples of the oil. Oils of turpentine, rosemary, spike lavender and Spanish lavender are the most common adulterants. American turpentine oil lowers gravity and diminishes rotary power. French turpentine oil lowers gravity but increases rotary power. Spike oil increases gravity and lowers the rotary power but does not affect solubility. Spanish oil acts similarly to spike oil but has less effect on rotary power. Rosemary oil increases gravity, lowers rotation and decreases solubility. Spike oil enriched by esters is difficult to detect.—Pharm. Era, 49 (1916), 223. (C. W. B.)

Lavender.—*Disease of.*—W. B. Brierly had his attention drawn to two large beds of Lavandula officinalis in which practically every plant was dying. Affected shoots presented a dry, dirty brownish gray color, and the epidermis tended to split away in minute silvery flakes. The leaves kept their normal appearance for some time, and then somewhat rapidly wilted and became brown and shriveled. All portions of the plant above the dry discolored areas died. This is a not uncommon disease of lavender, and at times is the cause of serious loss to growers. The disease spreads rapidly. Examination of a diseased shoot showed that the shriveled portion of the stem under the flaking epidermis was studded with very minute blackish brown points, which proved to be the pycnidia of a fungus ramifying in the tissues. This fungus was identified as Phoma lavandulæ, a species hitherto unrecorded in England. By removal of all affected shoots as soon as noted, and if possible before pycnidia are formed, the disease may be kept in check.—Kew. Bull.; through Pharm. J., 97 (1916), 85.

Laurel Root.—*Substitute for French Briar.*—French briar is the root of the white heath or "bruyers" and is shipped largely from Algiers. The roots are cleaned, sawed into blanks, which are simmered in hot water for about 12 hours. This process imparts a rich red-brown color, so desirable in smoking pipes. On account of the scarcity and high price, owing to the war, the U. S. Forest

Bureau has conducted experiments to find substitutes. The root of the mountain laurel is highly recommended, although it is softer and therefore burns out more readily than French briar. A number of various kinds of chapparal, which are abundant in the West, give promise of yielding a substitute. Other woods now widely used for pipemaking are applewood, red gum, ebony and birch, together with smaller amounts of olive wood, rosewood and osage orange.—Sc. Am., Sept. 23, 1916, 290. (O. R.)

Maple Wood.—*Substitute for Briar.*—Applewood and black and wild cherrywood are used as substitutes for French briar, but they burn out more rapidly than mountain laurel and rhododendron. Hard maple wood is a still better substitute, being a sweet wood, absorbing the juices like clay, without the unpleasant taste of a clay pipe. Hard maple pipes will color like meerschaum. The wood is furthermore free from holes and therefore does not need putty.—Hardwood Record, Aug. 10, 1916. (O. R.)

Lobelia Preparations.—*Assay of.*—Vanderkleed and E'we obtain the volatile alkaloid from lobelia by macerating with a mixture of alcohol, ether and ammonia water, shaking out with 2 per cent. sulphuric acid, making the acid solution alkaline with sodium carbonate, shaking out with chloroform, mixing the chloroform extract with ether saturated with hydrochloric acid gas, evaporating on a steam-bath and then drying the alkaloidal hydrochloride to constant weight in an air-bath. The residue is then titrated for chlorides by the Volhardt method.—J. Am. Pharm. Assoc., 5 (1916), 713.

Maize.—*Toxicology of.*—B. Gosio reports that when the two bacteria Penicillium puberulum and Penicillium stoloniferum are allowed to act on maize, two acids, penicillic acid, $C_8H_{10}O_4$, and mycophenolic acid, $C_{17}H_{20}O_6$, are formed, the latter of which is harmless while the former in doses of .3 Gm. per kilo body weight produces tetanus and therefore may be considered as one of the causes of pellagra when produced by eating spoiled maize.—Hyg. Rundschau; through Pharm. Weekblad, 53 (1916), 37. (H. E.)

Manna of the Hebrews.—M. Chas. Rolland, referring to the use as an aid to parturition by Persian women of a substance known as "Chirzadé," states that this is the Persian name for Lecanora esculenta, the manna of the Israelites. He explains the spontaneous appearance of manna in this way: The lichen becoming dry is blown long distances in the form of dust, and covers the ground.

A shower of rain is sufficient to cause the lichen to grow rapidly, and thus it would appear to the Israelites that the manna had fallen from heaven. M. Rolland states that the lichen has considerable nutritive properties, due to the 20 to 25 per cent. of lichenin which it contains—sufficient to support life for a long time.—Bull. Comm.; through Pract. Drug., Sept., 1916, 39.

Mustard Seed.—*Laxative Action of.*—E. C. van Leersum refers to whole white mustard seed which has long been currently used for a laxative in some countries. He states that its efficacy is probably due to this generation of sulphuretted hydrogen and also of carbon dioxide, which stimulate bowel functioning. This explains also the cyanosis in the cases of poisoning from mustard seed. So long as the gas is harmlessly eliminated by the lungs there is no disturbance.—Nederlandsch Tijdschrift voor Geneeskunde; through J. Am. Med. Assoc., 67 (1916), 1404. (W. A. P.)

Mustard.—*Assay of.*—Penau suggests the following method of procedure: 5 grammes of the mustard to be valued are placed in a retort, 100 mils of distilled water added, and the whole allowed to stand for a period of about six hours, at room temperature. Then add 26 mils of alcohol, and 26 mils of olive oil. The mixture is then subjected to distillation on a glycerin-bath, and 90 mils of distillate collected in an Erlenmeyer flask, containing 10 grammes of 5 per cent. ammonia. Care must be taken that the delivery tube extends well into the ammoniacal liquid. 20 mils of tenth-normal silver nitrate V. S. are added to the distillate and the whole set aside for twenty-four hours in a dark place. The mixture is then passed through a Joulie filter, washing with distilled water and adding, drop by drop, nitric acid until the liquid shows a decided acid reaction. The excess of silver nitrate is precipitated by addition of 10 per cent. hydrochloric acid, and after a period of rest extending over twenty-four hours the precipitate is collected on a double-tared filter. After drying and weighing the proper calculations are made.—Rep. Pharm.; through C. U. C. P. Al. J., 23 (1916), 169. (G. C. D.)

Myricaceæ.—*Some Facts about.*—H. W. Youngken describes the plants belonging to this family. On the Eastern seaboard are found Myrica cerifera, M. carolinianensis, M. inodora, M. gale, Comptonia asplenifolia and M. macfarlanei, the last being a hybrid. M. californica and M. harwegi occur in California and Oregon. M. cerifera is evergreen and occurs as far north as Tuckahoe, N. J.,

but is always confined to coastal regions. M. carolinianensis is deciduous and is widely distributed along the coastal plain even to a height of 1200 ft. Hybrids with characters intermediate are frequent. The plants furnish valuable products to medicine and the arts. The wax has been held to be astringent and narcotic. The chemical and physical characters of this wax are discussed in this article. The bark is stimulant and astringent and the leaves while sharing these properties are also aromatic. The oil from the leaves as examined by Rabak is described. M. gale has been used as a substitute for hops. The volatile oil from the green overground portions of this species is known as Dutch Myrtle Oil. The chemical properties of this oil are given. Comptonia asplenifolia occurs from Nova Scotia to North Carolina and is deciduous. The bark contains benzoic and tannic acids. All parts of the plant have been claimed to be tonic, astringent and alterative. It has also been used in ivy poisoning. The syrup may be used to disguise quinine. M. nagi of Japan yields an edible fruit. M. macfarlanei, a hybrid, was named by the writer.—Drug. Circ., 60 (1916), 5. (C. W. B.)

Nux Vomica.—*Strychnine Assay of.*—H. R. Jensen publishes a careful study of nux vomica assays, in which he gives a bibliography of 15 references. He points out the usual method of separating the brucine from the total alkaloids (oxidation with nitric acid) is defective inasmuch as the residue thus obtained is not pure strychnine. In it he has detected distinct quantities of strychnine nitrate, which leads to too high results if the "residual strychnine" is weighed and too low if it is titrated. For this reason, the Brussels Conference standard of total alkaloids (incorporated in U. S. P. IX) is more exact although for pharmacological reasons, a knowledge of the strychnine content of nux vomica is often desirable. His investigations show that by determining the "residual strychnine" both gravimetrically and volumetrically and making the proper calculations, the observed margin of error can be reduced very materially.—Pharm. J., 67 (1916), 458.

Oil-Bearing Nuts.—*Those Found in the Philippines.*—Investigations have been made by the Philippines Bureau of Science, concerning the qualities of the calumpang nut, which has been found to be edible, though slightly purgative when eaten in large quantities. The composition of the nuts, as analyzed by the Bureau of Science, is: Fat (by extraction of dry seeds), 51.78 per cent.; protein, 21.61 per cent.; starch, 12.10 per cent.; sugars, 5 per cent.;

cellulose, etc. (by difference), 5.51 per cent.; ash, 3.90 per cent. The oil expressed from the calumpang is sweet, with a comparatively high melting point. Its color is a light yellow. One chemist reports that it appears to resemble olive oil very much in its physiological action. It is non-toxic, and has no irritating action. It can be used in the same manner as olive oil, and should be especially useful for culinary purposes. Additional facts have also been ascertained concerning the oil-bearing nut Chisochiton cumingianus in recent investigations by local scientists. The plant belongs to the natural family in which the Philippine santol occurs. The nut is known in many parts of the islands, from northern Luzon to southern Mindanao. The name applied to it in Camarines Laguna, "balucanag," is taken to indicate that the natives recognize the nuts as oil-bearing, for the same name is applied to another and well-known oil-bearing nut, although the two are not alike in any other particular. The Chisochiton cumingianus is described as half ellipsoidal in shape, when fresh, and as averaging 3 Cm. in length and 2.5 Cm. in width at the widest portion. The shell is rather hard, constituting about 60 per cent. of the total weight, and it is difficult to separate it from the meat. In a quantity of shelled nuts tested by the Bureau which used petroleum ether for the purpose, about 31 per cent. of the whole nut was a reddish brown oil. The composition of the dry kernels was found to be as follows: Fat (by extraction), 44.12 per cent.; protein, 9 per cent.; ash, 3.19 per cent. The dry kernel yielded 35.56 per cent. of oil on expression. The oil had a rancid odor, was non-drying. On experiment it was found to have purgative properties. This oil, however, was found to have a weaker laxative effect than castor oil, five parts of it being approximately equivalent to one part of castor oil. This oil, more commonly called cato, was found by the Bureau of Science to be valuable for soap-making.—Pharm. J., 97 (1916), 475.

Olive Tree Manna.—*Production.*—Battendier reports a very unusual phenomenon—the formation of manna on Algerian olive trees. The trees had been attacked by the larvæ of a beetle named cossus ligni perda, and the cavities and galleries produced by the larvæ were filled with manna. In addition to this, the trunks were covered with large stalactites of the sugar.—J. pharm. chim.; through Drug. Circ., 60 (1916), 405.

Opium.—*Morphine Assay of.*—G. Guerin suggests the following procedure: 7.5 grammes of opium, dried at 60° C., are triturated,

carefully and thoroughly, with 3 grammes of slaked lime, after which 30 mils of distilled water are added to the mixture. This is then transferred to a glass-stoppered flask, having a capacity of about 125 mils. The mortar and pestle are washed with 45 mils of distilled water, and the washings added to the contents of the flask.

The mixture is allowed to stand for a period of about two hours, and shaken frequently during this time. It is then filtered, and 52 mils of the filtrate collected in a wide-mouth Erlenmeyer flask, having a capacity of from 110 to 120 mils. Next add 1 gramme of ammonium chloride and 5 mils of acetone to the filtrate, and set aside for twenty-four hours to crystallize. The crystals are collected on a tared filter, and washed carefully with distilled water, until the last trace of chlorides has been removed. The crystals are further washed with four portions of 15 mils each, of anhydrous acetone, which has been previously saturated with morphine, then dried at 100° C., and weighed. The quantity of morphine obtained will represent that which was contained in 5 grammes of opium. Extract of opium and tincture of opium may be assayed in the same manner, using about 3 grammes of the extract and about 75 mils of the tincture.—J. pharm. chim.; through C. U. C. P. Al. J., 23 (1916), 168. (G. C. D.)

Opium.— *U. S. P. and B. P. Assay Methods Compared.*—C. E. Smith finds that the methods of U. S. P. VIII and of the British Pharmacopœia give fairly concordant and accurate results; both, however, show a tendency towards yielding too high figures. This is due to the inclusion in the morphine of small quantities of other alkaloids, notably codeine, which have a relatively high titration value, as well as alkaline inorganic matter. To avoid this error the following method of double titration is suggested. Mix thoroughly the weighed crude morphine from 10 Gm. of opium, and divide it into two equal portions. Boil one part in a flask with about 30 mils of neutral absolute alcohol, until there is no further visible diminution in the amount of insoluble residue. Filter and wash the residue with hot absolute alcohol until free from alkaloid. Dilute the filtrate and washings with an equal volume of distilled water which has been previously made neutral, if necessary, to methyl red. Titrate with N/10 acid, using methyl red as indicator. Evaporate the alcohol from the titrated solution, below a boiling temperature; add fixed caustic alkali in moderate excess of the quantity to convert the morphine into alkali morphinate. Shake

out the alkaline liquid with 10, 10, and 10 mils of chloroform Filter the chloroform extracts, wash the filter with chloroform, and evaporate the filtrate to dryness. Titrate this residue with N/10 acid, and deduct the amount of acid used from that of the first assay. This gives the true morphine equivalent. To the weight of hydrated morphine found in 10 Gm. of opium add 0.0564. The volumetric solutions employed should be standardized against pure morphine solutions. This correction is also applicable to lime and other morphine precipitation methods with a suitable readjustment of the solubility correction factor.—Am. J. Pharm., 88 (1916), 292.

Opium Assay.—Vanderkleed and E'we, as a result of the comparative analyses of opium and its preparations, have decided that allowing a longer time than 16 hours for the separation of morphine crystals in the assay method of U. S. P. VIII, did not necessarily yield a less pure product than when the 16-hour rule was observed. —J. Am. Pharm. Assoc., 5 (1916), 717.

Opium.—*Quality of Indian.*—According to a statement by the Imperial Institute, of 102 samples of opium, 51 showed an average of 10.26 per cent. of morphine calculated for dry opium. 21 contained 7.5 per cent. and 30 per cent. contained so little morphine that they were unfit for medicinal use. The percentage of codeine varied from 4.04 to 2.18 per cent. Warning is given against the habit in India to add oil to the opium because by this manipulation the amount of morphine is reduced and the opium is rendered almost unfit for being converted into galenical preparations.—Pharm. Weekblad, 53 (1916), 797. (H. E.)

Opium.—*Quality of Persian.*—Svirlevski gives his findings regarding the percentage of morphine in Persian opium. This generally varies from 4.4 to 11.1 per cent., but samples have been found containing as high as 19.0 per cent. and as low as 0.38 per cent. Most of this Persian opium, however, meets the requirements of the various pharmacopœias.—Pharm. J.; through Drug. Circ., 60 (1916), 751. (H. H. S.)

Opium in the Pharmacopœia.—Those interested in tracing the history of commonly used medicines will find an exceedingly interesting article presented as a paper to the Historical Section at the San Francisco meeting by M. I. Wilbert, under the above caption. The fact is cited that of the 34 titles under which opium with its alkaloids and preparations have appeared in the various pharmacopœias, no less than 25 are included in the present edition. He

interestingly outlines the history of such well-known galenicals as black drop, laudanum, paregoric, brown mixture, Tully's powder, pills of opium (originally called Mathews or Starkey's pills), extract of opium and tincture of deodorized opium. The paper closes with a summary of the changes affecting the official opiate in question in the pharmacopœias from 1820 to 1905.—J. Am. Pharm. Assoc., 5 (1916), 688. (L. S.)

Opium.—*Manufacture of the Smoking Variety.*—H. G. Greenish contributes a paper illustrated with six photographs showing various stages of the preparation of smoking opium in China. This is primarily an aqueous extract of opium and its packing shells, subjected to toasting and afterwards purified by re-solution, filtration and evaporation.—Pharm. J., 96 (1916), 517.

Smoking Opium.—*Identification of.*—F. D. Simons has studied the differences between types of smoking opium, with particular reference to their distinction from pharmaceutical extract of opium. The best type of smoking opium is an aqueous extract made from opium that has been kneaded and partially roasted prior to extraction. The heat necessary in this operation decomposes the codeine, papaverine and narceine and diminishes the amount of thebaine. This in turn affects the ratio between the morphine and total alkaloid content of the extract under examination. In smoking opium the ratio runs from 1 to 1.11 to 1 to 1.50. In pharmaceutical extract of opium the ratio varies between 1 to 1.50 and 1 to 2. The water content is another point of distinction, although the writer does not make clear in his paper "the basis for comparatively reliable judgment" of which he writes. The article gives detailed description of the alkaloidal assay methods used.—J. Ind. Eng. Chem., 8 (1916), 345.

Papain.—*Activity When Dry.*—Experiments have shown dried papain to be less active usually than the fresh latex, although rapidly sun-dried papain is nearly as active as the fresh. Prompt drying after collection, to prevent destruction of the enzyme by fermentation, also gives a more active product. Digestion by papain proceeds rapidly during the first 10 minutes, and reaches its maximum within 1 hour, although surrounding physical conditions cause some variance.—Philipp. J. Sci.; through Chem. and Drug., 88 (1916), 1036. (K. S. B.)

Peppermint.—*Cultivation in Holland.*—Professor van der Wielen tried to cultivate peppermint from runners of the Mitcham Mentha piperita but these endeavors failed; the experiments will be continued after the war. In the meanwhile, however, seed of Mentha piperita has been bought in Holland and Germany. As it is generally thought at present that Mentha piperita is a hybrid M. aquatica and M. viridis, seedlings of various types could be expected if the seed is really that of M. piperita. This has actually occurred, and in the exhibition more than twenty mentha types were shown obtained from the seed of M. piperita; not one of the plants, however, has the genuine smell of peppermint.—Chem. and Drug., 88 (1916), 911.

Peru Balsam.—J. C. Umney points out that while the British pharmacopœal limits of density 1.140–58 include nearly all pure samples of Peru balsam, an occasional sample may be found as low as 1.135. Cinnamein has density of about 1.100 and a low density should therefore accompany a high cinnamein content.—Perf. Essent. Oil. Record, 7 (1916), 249; through Chem. Abstracts (1917).

Physostigma.—*History of.*—Gordon Sharp describes interestingly the history of the Calabar bean, or the esere nut, from 1840, when Dr. Daniell, a missionary laboring on the Calabar Coast, described its use by the natives in trial by ordeal. The paper discusses besides history, the botany, chemistry and pharmacology of physostigma.—Pharm. J., 96 (1916), 619.

Piper Methysticum.—*Vascular Anatomy of the Stem.*—Rachel E. Hoffstadt reports a painstaking study of the stem of the plant from which Kava-kava is derived with comparisons made with the closely allied Mexican plant, Piper umbellata. The article is illustrated with 22 cuts showing the anatomy of the stem and buds tracing the progress and divisions of the fibrovascular bundles. She finds that the stem of Piper methysticum consists of two systems of bundles, peripheral and pith, the latter in two rows; that the peripheral bundles are of two sizes, the smaller being branches of the larger; that the bundle type is collateral endarch and that the bundles (of foliar origin) remain in the peripheral region through one internode and then traverse the pith through two internodes; that the pericycle consists of only a few cells outside of the bundle, which become lignified, that there is no differentiated endodermis, that the stem enlarges by cambial activity; that an interfascicular

cambium appears late in the internode; that leaf traces are many and that the base of the leaf is sheathing and vernation is involute.

Piper umbellata has only one ring of pith bundles; has mucilage canals running through the center of stem and node; has fibro-vascular bundles run through the periphery in one node and in the pith in one node, before fusing with those of the leaf above.

The article has a bibliography of 19 references.—Am. J. Pharm., 88 (1916), 485.

Poison Ivy.—*Remedies for.*—The following are suggested:

1. Almost instant relief is afforded by the application of a hot aqueous saturated solution of magnesium sulphate. The remedy is to be applied locally every five minutes for an hour, and repeated every three hours for an additional hour should the first or second application not afford relief. The sponsor for this treatment says that it will do the work practically every time.

2. According to the "American Botanist," fire-weed, touch-me-not, and burdock are all specifics for the cure of ivy poisoning. The parts affected are rubbed with the leaves of any one of these three plants. Fresh leaves must be used each time, and it is necessary to bruise and crush the leaves in order that the sap will freely moisten the poisoned skin.

3. A solution of sodium salicylate (2 drams), and fluid hydrastis (1 dram), in water (enough to make 1 ounce), will do the trick every time, and in short order at that.

When the case is seen late and a very large surface is already raw, an ointment made of white petrolatum and acetanilide helps and hastens the cure.—Drug. Circ., 60 (1916), 418.

Polyporus Fomentarius.—*Use as Hemostatic.*—According to Reynés, amadou or the tissue of Polyporus fomentarius (formerly known as "fungus chirurgorium") is now used as a war hemostatic. It is easily sterilized by dry heat at a temperature of 130° to 140° C., and is in no way altered in the process; it remains quite soft and supple, and is ready for various purposes. Its chief use is in serious or obstinate hemorrhage, when ligature is not possible, as in bone lesions of the limb, or the skull, and in injuries of the meninges or cranial sinuses. Plugging with gauze is not very effective in these cases, but the use of amadou has always been successful. The strips of amadou are left in place for 24, 36, or 48 hours, and then withdrawn. They do not adhere, and the hemostasis remains secure.—Le Prognès Med.; through Pharm. J., 96 (1916), 25.

Poppy.—*Alkaloids of the Black Variety.*—The opium obtained from the black poppy (Papaver somniferum nigrum) does not contain narcotine, according to Pelletier and Decharme, nor does it contain thebaine and narceine, according to Guibourt. While the absence of narcotine in the opium produced from the black poppy could be verified by Van Itallie and van Toorenburg, these investigators found that narceine and thebaine are present in the product. The opium contained 13.1 per cent. of morphine and 1.86 per cent. of codeine.—Pharm. Weekblad; through Drug. Circ., 60 (1916), 146.

Poppy Heads.—*Morphine in Fresh Juice of.*—It is generally claimed that the fresh latex of poppy heads does not contain any morphine, and that this is formed by a fermentation process on standing. After 15 days the latex, it is claimed, contains only 3 to 5 per cent. of morphine, and only after the lapse of several months does the opium contain the proper amount of morphine. Goris and Vischniac have examined the juice obtained from fresh poppy heads at once and have found it to contain 16 per cent. of morphine calculated for dry juice. In another experiment, in which fresh capsules of poppy grown from Turkish seed were incised, a latex was obtained which contained 18.9 per cent. of morphine calculated for the dry substance. On standing for about one year the latex contained only 17.7 per cent. of morphine.—Bull. Sci. Pharmacol.; through Drug. Circ., 60 (1916), 86.

Potato.—*Quantitative Determination in Bread.*—Ivan Rözsényi describes a method employed by him for years depending upon the amount and the alkalinity of the ash.—Ztschr. Nahr. Genussm.; through Pharm. Ztg., 61 (1916), 245. (J. H. W.)

Pinus Brutia and Pistacia Terebinthus.—*Resins from.*—L. Reutter finds that the resin obtained from Pinus brutia appears in the form of brownish yellow, brittle masses, possessing a turpentine-like odor. It is very soluble in acetone, alcohol, ether and chloroform, and less soluble in oil of turpentine, benzene, toluol, carbon disulphide and petroleum benzine. Upon distillation it yields an oil containing borneol. 26.55 grammes of the resin consisted of 3.5 grammes of resin acids, soluble in ammonium carbonate; 8.5 grammes of resin acids, soluble in sodium carbonate; 4.2 grammes of volatile oil, 3.90 grammes of resin and 6.45 grammes of woody fiber.

He also finds that the resin obtained from Pistacia terebinthus appears in the form of masses possessing a balsamic, turpentine-like odor, the exterior being hard, and the interior of the masses much softer in consistence. When viewed under the microscope numerous needle-shaped crystals are seen, which are very soluble in ether. About 75 per cent. of the masses are soluble in either alcohol or oil of turpentine, but they are almost entirely dissolved by chloroform, ammonia water, solution of potassium or sodium hydroxide and carbon disulphide. Ether or petroleum ether are poor solvents. 172 grammes of the resin contained 17.6 grammes of volatile oil, 3.6 grammes of resin acids soluble in ammonium carbonate, 63.5 grammes of resin acids soluble in sodium carbonate, 25 grammes of acids soluble in solution of potassium hydroxide, 45.9 grammes of substance readily saponified, 3.6 grammes of ether-soluble substance and 12.8 grammes of woody and mineral manner.—C. U. C. P. Al. J., 23 (1916), 169. (G. C. D.)

Ragweed Pollen.—*Obtaining in Large Quantities.*—R. P. Wodehouse strips the flower heads from young plants, just coming into bloom, and after being allowed to become almost dry, these are crushed in a mortar with several volumes of carbon tetrachloride. After thoroughly macerating, the liquid is strained off through muslin. Most of the pollen, liberated by crushing from the anthers, passes with the CCl_4 through the muslin and can be collected on filter paper and washed with fresh CCl_4, or with the same, after filtering out the pollen, to remove what pollen remains after the first washing. The CCl_4 can be used several times, or until it becomes impregnated with oil, etc., when it should be replaced or distilled to remove the impurities.—Boston Medical and Surgical Journal; through J. Am. Med. Assoc., 66 (1916), 1165. (W. A. P.)

Rhubarb.—*Quality of Altai.*—A. Tschirch and M. Ruzzkowski report upon the value of samples of rhubarb obtained from the Altai mountains. They succeeded in isolating the following-named bodies: (1) The glucoside rhaponticin, which upon hydrolysis splits into *d*-glucose and rhapontigenin. (2) Methoxy chrysophanic acid, melting point 175°. This acid was decomposed into chrysophanic acid and emodin monomethyl ether. (3) Emodin, possessing a melting point of 250°. (4) Two glucoside groups, (*a*) Tannoglucoside and (*b*) Anthraglucoside. Oxidation of these resulted in the production of rheum-red and rheonigrin. (5) *d*-Glucose. Valuation of these samples of rhubarb by the Tschirch method

showed the presence of 3.20 per cent. of oxy-methyl anthrachinon, and they therefore meet all requirements.—C. U. C. P. Al. J., 23 (1916), 12. (G. C. D.)

Rhus Diversiloba.—*Poisonous Principle of.*—J. B. McNair extracted the limbs and also the leaves of Rhus diversiloba with gasoline and obtained a black residue, which in alcoholic solution was found extremely poisonous. From this black residue he was unable to obtain crystalline substances but his attempts to obtain from it by hydrolysis fisetin, rhamnose and gallic acid even as Syme obtained from the black residue from Rhus toxicodendron proved futile. As the two plants are so closely allied botanically, McNair believes that Syme's work on Rhus toxicodendron should be repeated.—J. Am. Chem. Soc., 38 (1916), 1417.

S. F. Acree answers the foregoing criticism of the work of the late Dr. Syme by pointing out that a gasoline extract might contain quite different principles than would the ether extract used by Syme and that botanical similarities do not inevitably mean similar chemical constituents.—J. Am. Chem. Soc., 38 (1916), 1421.

Rosin.—*Determination in Gum Resins.*—A method calculated to give approximate results is proposed by Hutin. Rosin is shown to be present by saponifying 1 gramme of the gum resin with the minimum quantity of sodium hydroxide. After dilution with water, a solution of copper sulphate is added in slight excess. If rosin was present it will be shown by the formation of resinate of copper, green in color and soluble in oil of turpentine. In order to approximately determine the quantity of rosin present, the sample to be tested is powdered finely and dissolved in 97 to 98 per cent. alcohol, sand is added, and the whole evaporated on a water-bath to complete dryness. The dry mass is powdered, again mixed with sand and alcohol and again evaporated. The same process is repeated several times. Finally the sand-containing mixture is extracted in a Soxhlet apparatus, with chloroform, for four hours. The rosin is thus dissolved, and the gum resin left behind. The sample may also be treated with solution of borax, using a 10 per cent. solution. The gum resin is then dissolved, and the rosin left. —Caoutchouc et Gutta Percha; through C. U. C. P. Al. J., 23 (1916), 219. (G. C. D.)

Rubber.—*Production from Alcohol.*—A Russian patent has been obtained by L. J. Ostromislenskij for producing rubber by first pumping air through alcohol, and the mixed vapors are passed

through copper tubes containing spirals of red copper and silver gauze. The latter are at first heated, but during the subsequent process remain incandescent. Acetic aldehyde and paraldehyde are thus formed. These are mixed with more alcohol and passed over strongly heated aluminium oxide, producing erythene, which is collected in an autoclave wherein a small quantity of a catalyst has been placed. By this means is obtained raw erythrene rubber, a pure chemical compound having the formula $(C_4H_6)n$, identical with chemically pure natural rubber but oxidizing more rapidly, so that it is necessary to protect it from atmospheric action and fit it for use in other respects by adding about 15 per cent. of admixtures. These are tannins to resist oxidation, amines mixed with lead oxide to aid in vulcanization, and rubber resins to increase elasticity.—Chem. News; through Pharm. J., 97 (1916), 185.

Rubber.—*Comparison with Its Substitutes.*—The results of the work of Alfons Langer are as follows:

Behavior of Para caoutchouc: It dissolves in benzol, chloroform, carbon tetrachloride by first swelling, taking up the solvent and after 10 to 12 hours forming, even when dilute, strongly viscous true solutions (not unfilterable colloid solutions). When boiled with 10 per cent. alcoholic potassium hydroxide it is difficultly attacked and colors it only slightly. It behaves in the same manner towards concentrated sulphuric acid in the cold. For the above trials the rubber is cut into pieces of 2 by 5 Mm.

Of two caoutchouc substitutes: "A" was gelatinous like a Para rubber swelled in benzin, was very sticky, on stretching broke off short and smelled of naphthalene. It was almost insoluble in benzol, chloroform, carbon tetrachloride, the slightly soluble portions coloring the solvents yellowish. On steam distillation naphthalene passed over. On boiling the distillation residue with 10 per cent. alcoholic potassium hydroxide it quickly formed a brownish black solution with separation of a partly pulverulent, partly gum-like yellowish brown residue amounting to 17 per cent. of the distillation residue. The alcoholic solution when evaporated left a yellowish brown soap which readily dissolved in water and when decomposed with phosphoric acid yielded 56 per cent. free fatty acids (= 54 per cent. based on original material). The unsaponifiable material dissolved almost clear in ether and very readily in chloroform which latter solution when layered over sulphuric acid gave immediately a red zone deepening in time. From the lye containing phosphoric acid glycerin was obtained.

"B" was fluid, of the consistency of a fresh honey, transparent, and smelled of naphthalene. The solubility corresponded almost with that of "A." With steam 10 per cent. naphthalene was driven over. The dried distillation residue was a transparent, rancid light brown oil showing with further treatment the behavior of "A."

Natural rubber also contains saponifiable matter but the amount is only 0.3–4.0 per cent.—Pharm. Ztg., 61 (1916), 14. (J. H. W.)

Rubber.—*Use as Diffusion Membrane.*—Experiments by James Dewar show that India rubber membranes 1–50 to 1–100 Mm. thick, supported upon filter paper, will diffuse gases readily, and may be used under high pressure.—Chem. and Drug., 88 (1916), 182. (K. S. B.)

Saffron.—*Adulteration of.*—O. Tunmann found in an allegedly pure sample of powdered saffron from France numerous particles of anther walls without, however, any indication of a corresponding amount of pollen, from which it is argued that the stamens and stigmas are collected separately and, after sifting out the pollen, united and dried. The question is worthy of consideration whether it would not in general be better to count the anther walls and not the pollen grains. The sulphuric acid reaction yields with the former a color hardly distinguishable from that obtained with the stigmas. The reaction depends here on the one hand upon the presence of carotin, on the other upon a coloration of the stigmas during the process of powdering. The tinctorial power of the powder corresponded to the too low requirements of the German Pharmacopœia.—Apoth. Ztg., 31 (1916), 230; through Chem. Abstracts (1917).

Saffron.—*Detection of Safflower in.*—A. Verda states that an old solution of phosphomolybdic acid reagent acts better than one that is fresh. It also leaves intact the outer membrane of the pollen grains of the safflower, thus aiding in determining approximately the amount of adulterant present.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 10 (1916), 2783.

For detecting safflower in saffron, Vicari recommends sulphophosphomolybdic acid, which is prepared by adding 60 mils of concentrated sulphuric acid to 40 mils of a 10 per cent. solution of sodium phosphomolybdate. The sample under examination is finely powdered, and a small amount of the powder transferred to a slide and stirred with one drop of the reagent, until the mixture has acquired a bluish green color. The excess of reagent is then

removed in the usual way and the sample viewed through the microscope. True saffron has been colored blue; safflower, red.—Schweiz. Apoth. Ztg.; through Drug. Circ., 60 (1916), 144.

Saffron.—*Importance of Nitrogen Content.*—Pierlot's determination of the nitrogen content of 40 samples of authentic saffron gave figures ranging from 2.22 to 2.437 per cent. Inorganic ammonia is usually less than 0.04 per cent. and the nitrogen of saffron seems to be in the form of lecithins. As potassium nitrate is sometimes used to adulterate saffron, both total and inorganic nitrogen should be determined.—Ann. fals.; through Chem. Abstracts 10 (1916), 1690.

Saffron.—*Storing of.*—F. R. Braune recommends the storing of Spanish saffron in a small glass-stoppered shelf bottle, with a pledget of moist cotton fitting into hollow stopper. Not only does this render the saffron fresh looking and sweet smelling, thus pleasing the customer more than does a bone-dry sample, but is also good business.—New Idea; through Merck's Report, 25 (1916), 189.

Santonica.—*Use in Gapes of Poultry.*—Carles recommends santonica as a preventive and cure for gapes in fowls. As is well known, this disease is due to the presence in the throats of affected fowls of a parasite worm. From the asphyxia its presence causes, the fowls keep their beaks open to assist breathing; hence the vernacular English name of the malady. Many empirical remedies are vaunted as a cure, from asafetida to sodium salicylate. Rough-and-ready surgical interference is also employed. This generally consists of introducing a feather into the trachea, twisting it round to entangle the worms, which are then withdrawn. All these methods are crude and appear to have but little real value. The author advocates the administration of 2 to 3 teaspoonfuls of santonica intimately mixed with 100 grammes of hot mashed potato. This is given to the fowls as a feed after standing for an hour or over night, for the capitula of the drug to have become softened. As a preventive it should be used several times weekly in every poultry run when gapes is threatened. This treatment is claimed to destroy the eggs of the worm, as well as the parasite itself, and to be quite harmless to the fowls.—Rép. pharm.; through Drug. Circ., 60 (1916), 147.

Sapindus Mukurosi.—*Saponin of.*—Asahina and Shimidzu have extracted from the epicarp of Sapindus mukurosi, a pure saponin giving the characteristic reactions and exhibiting in alcoholic solu-

tion the optical rotation of +13.28° at 20° C. It hydrolyzes apparently according to the following equation:

$$\underset{\text{Saponin}}{C_{41}H_{64}O_{13}} + 2H_2O = \underset{\text{Sapogenin}}{C_{31}H_{48}O_5} + \underset{\text{Arabinose}}{2C_6H_{10}O_5}$$

The arabinose was verified by its analysis and by the preparation of its phenyl-osazone (m. p. 158°) and of its para-bromo-phenyl-hydrozone (m. p. 156°).

The sapogenin melts at 319° and from it was prepared the potassium salt, $KC_{31}H_{47}O_5$, the barium salt, the triacetyl compound, $C_{31}H_{45}O_3$, $(CH_3CO)_3$ (m. p. 167°); the benzoyl sapogenin (m. p. 107°); and the monomethyl-sapogenin (m. p. 218°).—Jour. Pharm. Soc. Japan; through J. pharm. chim., 14 (1916), 188.

Saw Palmetto.—A thesis submitted by C. A. Mann, and published by the University of Wisconsin as a bulletin, deals with the synonymy, natural history, chemistry, moisture, inorganic constituents, ash, the so-called volatile oil, fatty oil, enzymes, carbohydrates, glucoside and alkaloid of sabal. He concludes that no volatile oil is present in the fresh fruit, but is a condensation product of the free fatty acid of the berries with the ethyl alcohol, the preservative.—Chem. and Drug., 88 (1916), 576. (K. S. B.)

Saw Palmetto.—*Preparations of.*—At the meeting of the Pennsylvania Pharmaceutical Association, Vanderkleed and E'we suggest the following recipes for saw palmetto preparations, which are beginning to be used as pectorals and sedatives.

Elixir of Saw Palmetto and Terpin Hydrate.—Dissolve 1.75 grammes terpin hydrate in 40 mils of fluidextract of saw palmetto and 10 mils of alcohol. Add 1 mil of tincture of sweet orange, 0.2 mil solution of saccharin, 40 mils of glycerin and 100 mils of syrup. This elixir contains 8 grains of terpin hydrate and 184 grains of saw palmetto to the fluidounce.

Syrup of Saw Palmetto.—Exhaust 15 grammes of saw palmetto with alcohol. Distil off the alcohol, add 15 mils of glycerin to the residue, warm and stir for a few hours. Then add 70 grammes of sugar and water enough to make 100 mils. Warm mixture until the sugar is dissolved.

Compound Syrup of Saw Palmetto.—Mix the alcohol extractive (residue after distillation as described above) from 15 grammes of saw palmetto with 1 fluidounce of compound syrup of white pine.—J. Am. Pharm. Assoc., 5 (1916), 720.

Scutellaria.—*Use in Epilepsy.*—William Bramwell suggests a trial of herb, skullcap, Scutellaria lateriflora in the treatment of epilepsy. He states that in many cases a simple infusion or extract in correspondingly suitable doses will lessen the severity of the fits and reduce their number equally with bromides and without any of the disadvantages of the latter. Its efficacy appears to be partly due to its stimulating the kidneys to increased activity not only in increasing the flow of water but also the output of urea and uric acid as shown by the increased specific gravity of the urine, the retention of such toxins as a cause of many cases of epilepsy being too frequently overlooked. The medicinal qualities of this simple remedy are even more marked in chorea than in epilepsy, and it is to be hoped that a similar investigation and a similar therapeutic distinction await skullcap as happened in the case of comfrey, the invaluable qualities of which were limited to the use of the herbalist, and consequently despised by the profession, until Dr. C. J. Macalister, wisely setting aside prejudice, determined to investigate it, and having discovered its cell-proliferating properties proved it beyond question one of the most valuable of remedies.—Brit. Med. J.; through Chem. and Drug., 88 (1916), 21.

Solomon's Seal.—*Constituents of.*—Jumeau finds in the ash of Solomon's seal, calcium, magnesium, potassium, aluminum and manganese in the form of chlorides, sulphates, phosphates and silicates. The drug also contains 1.66 per cent. of saponin, which is widely distributed in the plant the microscope showing it in the bark and cells of the roots, rhizome and stem as well as in the leaves, flowers and fruit. The drug also contains 5.55 per cent. of glucose, 0.15 per cent. of resins and a trace of tannin.—Bull. Sci. Pharmacolog.; through Chem. Abstracts, 10 (1916), 1691.

Soy Bean.—*Use as Infant Food.*—J. F. Sinclair's experience with soy bean leads him unhesitatingly to urge its usefulness in the treatment of summer diarrhea, in various intestinal disturbances and in marasmus. It is well borne, readily digested, and by reason of its fats and proteid content furnishes the necessary pabulum to nourish the sick infant. In a series of seventy-four cases, there were nineteen deaths, eleven cases were unimproved, while forty four babies did well as evidenced by the improvement in their general condition, character of their stools or gain in weight.—N. Y. State J. Med.; through J. Am. Med. Assoc., 66 (1916), 841.

Sphagnum Moss.—*Use as Surgical Dressing.*—R. I. Geare discusses the use of bogmoss (Sphagnum cymbifolium) in war surgery. It has greater springiness than has absorbent cotton and not only absorbs discharges but diffuses them throughout the whole pad, in this respect being better than cotton which frequently permits the discharge to pass through bandages and bedclothes. The article gives an illustration of the moss and outlines method of preparation for surgical use.—Merck's Rep., 25 (1916), 67.

In 1915, C. W. Cathcart called attention to the value of sphagnum moss, properly dried, prepared, and sublimated as an absorbent dressing for wounds. Since then great development has taken place in the use of the dressing, which is now placed on the list of approved materials by the British War Office. Four sub-centers have been established at Lerwick, Aberdeen, Oban, and Beattock, from whence consignments of the collected moss are despatched to Edinburgh, free of charge. Professor I. Bayley Balfour and the staff of the Edinburgh Royal Botanic Gardens have given much valuable advice, and Mr. W. W. Smith has made a survey of the district around Edinburgh and has reported on the best sources of supply on the neighboring moors and hills. Frequent communications are received stating that the moss is most serviceable. It has been found to be more absorbent than cotton-wool, and has a deodorant action. —Brit. Med. J.; through Pharm. J., 97 (1916), 27.

Sphagnum Moss.—*Harvesting of.*—Alexander M'Cutcheon discusses the use of sphagnum moss as a surgical dressing, which appears to have originated among the celtic races in Scotland, Ireland and Wales. The paper discusses in an interesting manner the harvesting, collection and properties of the moss.—Pharm. J., 97 (1916), 587.

Stramonium.—*Odorous Principle of.*—A. Sivolobor finds that the odorous matter obtained by distilling Datura stramonium with water, consists of methyl and ethyl alcohol, trimethyl carbinol, formaldehyde, propioaldehyde, isobutaldehyde and esters of formic and acetic acid.—J. Russ. Phys. Chem. Soc.; through Chem. Abstracts, 10 (1916), 2960.

Stramonium.—*Value of South African Products.*—Examination of samples of South African stramonium by the Imperial Institute and comparison with that obtained from India, Europe and Egypt showed the following results:

Source.	Alkaloidal Yield.
South African	0.54%
India	0.41 to 45%
Europe	Up to 0.40%
Egypt	0.28%

The chief alkaloidal constituent was hyoscyamine. The leaves measured from $1^1/_2$ by $2^3/_4$ inches to 7 by $8^1/_2$ inches. They were mostly of a sage-green color, although several showed patches of brown or dark green, while some small leaves were reddish brown. Bids from several manufacturing druggists indicated that South African stramonium would be readily salable.—Chem. and Drug., 88 (1916), 868. (K. S. B.)

Strophanthus.—*Emetic Action of the Drug and of Its Fixed Oil.*—R. A. Hatcher reports on experiments disposing of the claim that the fixed oil found in strophanthus causes the nauseating action of its tincture. He finds that while the pure green oil obtained from a specimen sold by a reputable house as S. Kombé caused nausea and vomiting when administered to cats in doses of 850 mils per Kg., the green-yellow oil from an authentic sample of S. Kombé failed to induce any nausea even when administered in doses of 1250 mils per Kg. He points out that the tincture contains only traces (0.24 to 0.62 per cent.) of the fixed oil and that the average therapeutic dose of the tincture contains only about one ten-thousandth of that required to produce nausea and vomiting in the cat, relative to weight. He found that the oil producing nausea in large doses contained traces of strophanthin.—J. Am. Pharm. Assoc., 5 (1916), 157.

Sumbul.—*Constituents.*—Heyl and Hart have isolated from a sample of sumbul root the following substances: Sucrose, levulose, betaine, a white acid resin yielding, on hydrolysis, vanillic acid and an oil, a phytosterol, $C_{21}H_{46}O$, m. p. 134–135° C.; acetic, butyric, valeric, tiglic, angelic, oleic, linolic, cerotic, palmitic, and stearic acids, a phytosterolin, $C_{33}H_{57}O_6$, m. p. 290° C.; neutral resinous substances, yielding umbelliferone on hydrolysis, and glucosidic resinous substances yielding umbelliferone and dextrose on hydrolysis. The ground material distilled in steam yielded an essential oil (0.68–1.1 per cent.) of sp. gr. 0.932 at 15° C., which on standing deposited a few yellow crystals, melting at 113–114° C.—J. Am. Chem. Soc., 38 (1916), 432.

Tobacco.—*New Alkaloids in.*—Noga has isolated from tobacco two new alkaloids which he has named *nicotoine* and *isonicotoine.* The former possesses the formula $C_8H_{11}N$, has the sp. gr. 0.9545, boils at 208° and has the refractive index 1.5105. Its odor resembles that of pyridine. Isonicotoine has the formula $C_{10}H_{12}N_2$ and occurs as an oily, colorless liquid with a sp. gr. 1.0984 and a refractive index 1.5749. It is optically inactive and yields nicotinic acid on oxidation. Mitth. K. K. Oesterr. Tabaksr.; through Pharm. Weekblad, 53 (1916), 1574. (H. E.)

Tobacco.—*Cultivation.*—A good general article on the cultivation and varieties of tobacco and on the manufacture of cigars.—Chem. and Drug., 88 (1916), 153. (L. S.)

Tobacco.—*Historical and Technical Observations.*—Under the above title the growth of tobacco in America, its importation into England and manufacture there into cigars and cigarettes are discussed.—Chem. and Drug., 88 (1916), 153–155. (K. S. B.)

Tobacco.—*Nicotine Assay.*—On account of the extensive use of tobacco preparations as insecticides and parasiticides, several methods for the estimation of nicotine in tobacco have been devised during the last few years. Rasmussen offers the following process in which the use of ammonia is entirely eliminated; the slightly high results obtained are due only to the presence of pyridine. 10 Gm. of the powdered tobacco are intimately mixed in a porcelain dish with a mixture of 30 mils of caustic soda solution and 10 mils of alcohol. The mixture is then transferred to a wide-mouth bottle, 50 mils of ether and 50 mils of petroleum ether are added and the bottle shaken occasionally for five hours. 50 mils of the ethereal solution are then filtered off and extracted with three portions of 25 mils each of 1 per cent. hydrochloric acid. To the combined acid solutions a 12 per cent. aqueous solution of silico-tungstic acid is added until a precipitate is no longer produced. Generally 10 mils of the solution are used. The mixture is allowed to stand for 10 hours, the precipitate is collected in a Gooch crucible or on a tared quantitative filter, washed well with water until the silico-tungstic acid is removed and dried to constant weight. The weight multiplied by 2.2024 gives the amount of nicotine in the tobacco. As a check the precipitate is heated to red heat and the weight of residue multiplied by 0.1140 gives the percentage of nicotine. Of tobacco extract 3 to 4 Gm., exactly weighed, are shaken with 5 mils each of caustic soda solution and water and 25

mils each of ether and petroleum ether, and 25 mils of the ethereal liquid are treated as given before. Z. anal. Chem.; through Pharm. Weekblad, 53 (1916), 1117.

Tobacco.—*Use as an Insecticide.*—M. R. Miller in a paper presented before the Entomology Club of the University of California describes at considerable length the following phases of tobacco: the active principle; chemistry of nicotine free and in the plant; mode of formation and function of nicotine in the plant; physical and chemical properties of nicotine; chemistry of its use and action; California tobacco; culture; manufacture; cultivation; harvesting; curing; nature of curing; air curing; flue curing; fire curing; use as an insecticide; methods of use of dried and cured; use of tobacco extract.—Pacif. Pharm., 10 (1916), 295. (C. M. S.)

Tonka Bean.—*History and Uses.*—Edward Albes writes most entertainingly and instructively of the tonka bean. The name seems to have been given erroneously on the assumption that it was introduced into Europe from Tonquin, China. It is the seed of Dipterix odorata and native to tropical South America. The valuable constituent is said to be coumarin. The article is replete with information concerning the geographical location of the trees, description of the fruit, methods of gathering and preparing for the market and varied uses of the product in the industries. Six illustrations accompany the article.—Mid. Drug., 50 (1916), 109. (C. M. S.)

Tragacanth.—*Constituents.*—Bassorin, the water-insoluble constituent of tragacanth, contains several methoxy groups. It is less rapidly hydrolyzed than pectin, the hydrolysis taking place only in the presence of hot caustic soda solution, according to v. Fellenberg. The bassoric acid formed in the hydrolysis can easily be titrated with standard alkali in the presence of phenolphthalein. It is precipitated both by alcohol and by the salts of various metals. —Chem. Zentr.; through Drug. Circ., 60 (1916), 398.

Valerian.—*Properties.*—P. van der Wielen gives some interesting points regarding valerian root. When this root is freshly gathered the younger roots show a much lighter color than the older ones; the younger roots are nearly colorless. In the commercial samples of valerian root this difference can no longer be seen, as under the influence of a ferment, an oxidase, the originally white roots have also assumed a dark color. Fresh valerian root

has practically no smell; this is only developed during the process of drying under the influence of a ferment, which may be the same or different from that which is the cause of the darkening of the root. If the enzyme is killed by stabilizing the drug before drying it, the root only develops in a small degree the typical smell of valerian. It still contains the substances, however, which can yield the essential oil to which this smell is due, and when an infusion of the stabilized root is warmed with a few drops of hydrochloric acid the originally nearly inodorous liquid soon acquires the typical smell of valerian. The same effect takes place in other galenicals made from fresh and stabilized valerian root by mixing the juice or the pulp with alcohol. Clinical experiments of French scientists have shown that fresh valerian root in which the original active principles have not yet been decomposed is to be preferred to the dried root, and Professor van der Wielen concludes that valerian preparations should henceforth be made from the stabilized drug.—Chem. and Drug., 88 (1916), 911.

Vanilla.—*Production in French Colonies.*—Vanilla is largely cultivated in Madagascar, but the market is limited, and the island is close to its competitors, Réunion and the Comoro, whose plantations are in active production, and yield vanilla of high repute. Malagasy vanilla is said to be somewhat poor in aroma. However, 113,662 kilos were produced in 1913, and the quantity has increased regularly since. Réunion vanilla is considered to be the best and fetches the highest price; the output before the war was about 52,165 kilos, which shows some decrease. The neighboring isle of Bourbon also produces vanilla, which has a peculiar fragrance, similar to that of Mexican "beans." In Tahiti vanilla is chiefly cultivated by the natives, and leaves much to be desired; consequently, Tahiti vanilla fetches a low price. It was chiefly exported to Germany and the United States. The crop is large, amounting to 187,152 kilos in 1913. In Guadaloupe the vanilla industry has declined, although the value of the crop has increased. Both Mexican and native vanilla are cultivated on the island. In Martinique, the vanilla output is small, amounting to only about 2,000 kilos, and it is stationary. A gradual development has attended the production of vanilla in French Gaboon, where the crop in 1913 amounted to 913 kilos. A wild vanilla occurs in the French and Belgian Congo. Vanilla is the main product of the Comoro Islands; that of the finest quality comes from Moheli Island, while Anjouan produces the greatest quantity. It is estimated that the French

colonies furnish two-thirds of the total vanilla output of the world. Of this, France herself consumes about one-tenth.—Moniteur Sci.; through Pharm. J., 97 (1916), 433.

Vanilla.—*Evaluation.*—T. von Fellenberg proceeds as follows: One gramme of the finely divided substance is boiled under a reflux condenser with four successive quantities of about 20 mils of water. The combined extracts are diluted to 100 mils, and 0.5 gramme of kieselguhr added and the mixture filtered. Fifty mils of the filtrate are extracted five times with ether (free from alcohol), using 150 mils of the solvent in all. The ethereal solution is treated with solid calcium chloride, filtered, evaporated to a small volume, and the remainder of the ether removed by a current of air. The residue is warmed to 60° with 30 mils of water, the solution filtered, and the filtrate diluted to 100 mils. Five mils of this solution are then treated with 5 mils of a 1 per cent. solution of isobutyl alcohol in 95 per cent. alcohol and 20 mils of concentrated sulphuric acid, and after 45 minutes the coloration produced is compared with that developed by a known amount of a standard solution of vanillin. It is recommended that the vanillin should be determined separately in the outer and inner portions of the pod; in normal vanillas, the vanillin is distributed approximately evenly throughout the tissues. Any difference between the two determinations would indicate a partial exhaustion of the outer portions of the beans.—Chem. Ztg.; through Chem. and Drug., 88 (1916), 876. (K. S. B.)

Vanilla Beans.—*Effect of Curing.*—F. Rabak of the Bureau of Plant Industry reports a study of the curing of vanilla beans. After describing the commercial methods in vogue—the Mexican dry sweating and Réunion hot water method—he describes curing experiments tried out by him in his laboratory, with 12 lots of beans, half of which were cured at room temperature, and the other half in a water oven at somewhat higher temperature. Each of the six lots cured at room temperature was given different treatment prior to the sweating and drying. The treatment consisted in dipping the green beans into water at various temperatures up to the boiling point. Each lot was kept wrapped in a soft towel and placed on the laboratory shelf to undergo the sweating and drying process. The duplicate lots of beans cured in the water oven at 40 to 55° C. received exactly the same treatment as those cured at room temperature. The results show that the curing process as

at present commercially applied is unnecessarily long and extended, requiring on an average several months for the transformation of the green to the cured beans. In his experiments the longest time taken for sweating was 46 days and this shortening of the process works advantage rather than detriment to the aromatic constituents. While the amount of vanillin in the beans was not increased appreciably, as compared with commercial beans, it may be stated with assurance that the beans cured in the laboratory were in most cases superior in vanilla resins and coloring matter. The superior flavor of the extracts prepared from the laboratory cured beans may, therefore, be ascribed to the resinous constituents. A considerable proportion of the vanilla resins are left unextracted when the menstruum is less than 65 per cent. alcoholic strength. Curing the green beans at room temperature either without previous treatment or after treatment with water up to 90° C. for a short period of time apparently produces beans of the best quality, as judged by the flavoring extract prepared from the samples.—J. Ind. Eng. Chem., 8 (1916), 815.

Viburnum Prunifolium.—*Inefficiency of.*—In the "Wine of Cardui" case, J. C. Webster testified that he gave up the use of fluidextract of viburnum prunifolium because he believed that the benefit that he obtained from its use in pain in association with menstruation, was due to the alcohol in it. He had never had any reason whatever to believe that viburnum was of any value in warding off a threatened abortion. When in cases of painful menstruation he used the solid extract which contained no alcohol, he could not get the same results that he had obtained before and he gradually gave up the use of the drug altogether. Arthur A. Small testified of extensive experience with the use of viburnum prunifolium, while resident physician in the Toronto General Hospital. As a result of his experience there he is of the opinion that viburnum prunifolium is of no value in the treatment of female disease. In these experiments both the fluidextract and the solid extract were used and it was found that the alcoholic solutions would prevent or lessen pain in some cases. In other words the only action was that of the alcohol. J. B. DeLee testified that years ago he gave large quantities of extract of viburnum prunifolium for the prevention of miscarriage but has found it useless.—J. Am. Med. Assoc., 66 (1916), 1338, 1566 and 1639. (W. A. P.)

Virginia Creeper.—*The Fat of the Fruit of.*—Fachini and Dorta state that the fruit Parthenocissus quinquefolia, P, or Ampelopsis quinquefolia, T, the familiar Virginian creeper, or Canadian vine, is composed of 10 per cent. of skins, 64.8 per cent. of pulp, and 25.2 per cent. of seeds. The seeds contain 11.8 per cent. of a dark, yellowish green oil, fluid at ordinary temperatures. The pulp and skins together contain 3.3 per cent. of a butterlike olive-green fat. The seed oil has the specific gravity 0.9215 at 15° C.; n_D 1.4778; saponification value 189.2 to 189.6; iodine value, 141.4 to 141.6; non-volatile fatty acids, 93.97 per cent.; unsaponifiable matter, 1.44 per cent.; iodine value of mixed fatty acids, 144.6; mean molecular weight of fatty acids, 281.2; iodine value of liquid acids, 148.8 to 149.2. The fat of the skins and pulp had the following characters: n_D 1.4722; saponification value, 192.3 to 193.3; iodine value, 90.3; non-volatile fatty acids, 94 per cent.; unsaponifiable matter, 1.67 per cent.; iodine value of total fatty acids, 94.4 to 94.6; mean molecular weight of fatty acids, 278.8; iodine value of liquid fatty acids, 110.2. The solid fatty acids amount to about 3 per cent. of the total seed-oil and 10 per cent. of the pulp-oil. They are almost wholly palmitic acid; and the liquid portion is practically all oleic acid in both cases.—Am. Chim. Applic.; through Pharm. J., 97 (1916), 361.

White Pepper.—*Fiber Content.*—Commercial samples of ground white pepper examined by Maurice S. Salamon and William M. Seaber showed fiber contents of 7 to 8 per cent. Powders prepared from good grade whole white peppers showed fiber contents less than 4.5 per cent., and several commercial samples of ground white pepper of known source ran from 1 to 3.2 per cent. fiber content, which led the authors to conclude that white pepper should contain not over 4.5 per cent. of fiber.—Chem. and Drug., 88 (1916), 146. (K. S. B.)

Wood Betony.—*Constituents.*—Schulze and Trier have isolated from Betonica officinalis, wood betony, a betain which they have named betonicin. It consists chiefly of two bases, true *betonicin* and *turicin*, the latter previously isolated by Kueng. The separation of the two bases can be effected by boiling alcohol in which turicin is very difficultly soluble. Synthetically betonicin was obtained by methylizing oxyprolin, a cleavage product formed in the hydrolysis of gelatin.—Chem. Ztg.; through Drug. Circ., 60 (1916), 146.

Yeast.—*Use as Food-stuff.*—H. Gregg states that feeding tests showed that yeast in dried as well as fresh state forms an excellent, appetizing mixing food which even in large amounts is without harmful action. In the case of working horses half the cereal food may advantageously be replaced with dry yeast and potatoes. For pigs also, dry yeast in conjunction with potatoes and other food-stuffs rich in carbohydrates was found serviceable. Rendering bitterless the beer yeast is accomplished by treatment with alkalies and subsequent thorough washing.

Yeast extract is an excellent substitute for meat extract; various methods may be used for its preparation. The yield is about 15 per cent. of the employed purified yeast with 18 per cent. total solids.—Tidskrift Kemi, Farm. Terapi; through Apoth. Ztg., 31 (1916), 24. (J. H. W.)

C—Animal Drugs and Products

Ambergris.—*Properties.*—Bruff states that the clumps of ambergris found in the ocean weigh 0.5–75 kilos and in cross-section show concentric layers of lighter and darker colors varying between grayish yellow and brownish black. In the entire clump are to be found the horny jaw-bones of a variety of cuttlefish which serves as nourishment to the Physeter macrocephalus. Ambergris is said to melt at 60° C.; the specific gravity is given as 0.908–0.920. At 60° C. it becomes of ointment consistency but it may be heated considerably more without melting. The specific gravity of a sample was 0.950. The saponification number in three cases was 17, 19 and 35. On ignition ambergris leaves only a trace of ash. It is adulterated with tallow, benzoin, olibanum, etc. It is rarely used in medicine any more, but in the perfume industry it serves as a fixative for other odors. Its purity is indicated by the presence of the above-mentioned jaw-bones and by the concentric layers and by the low saponification number.—Tidskrift Kemi, Farm. Terapi; through Pharm. Ztg., 61 (1916), 116. (J. H. W.)

Beeswax.—*Bleaching of.*—An interesting account of a visit to a plant where beeswax is bleached is given. The yellow wax is melted by steam heat and is allowed to flow into a tank of cold running water wherein it solidifies in shreds. These are spread on canvas sheets exposed to the sun's rays until the exterior is white, the pieces

being turned over several times during the operation. As the interior is still unbleached the shreds are remelted and re-shredded and the bleaching operation repeated until completely bleached. It takes about two weeks to bleach wax by this method.—Chem. Drug., 80 (1917), 477.

Beeswax.—*Detection of Stearic Acid in.*—Verda states that stearic acid may be detected in wax with a copper salt solution. Pure wax acquires only a light green color while wax containing stearic acid is colored distinctly blue.—Schweiz. Apoth. Ztg.; through Drug. Circ., 60 (1916), 754. (H. H. S.)

Beeswax.—*Importance of Proper Sampling.*—M. S. Salamon states that the difference in analysts' figures in reports on beeswax is more often due to defective sampling than to any other cause. The difficulty of obtaining a true wharf sample is considerable. It is suggested that shavings should be taken from as large a number of pieces as possible by means of a potato peeler. This enables the sample to be drawn from the middle of a piece of wax. Such impurities as gravel and portions of paraffin candles have often been found in the centre of a piece of beeswax. During this method of sampling, suspicious pieces after shaving may be set aside for separate examination. In a consignment of forty-eight bags of Chilian beeswax, five were sampled, four pieces being taken out of each. During the preparation of the laboratory sample three pieces were found to be of suspicious appearance. The figures obtained from the melted bulked sample of shavings were satisfactory. Those of the three reserved pieces indicated at least 25 per cent. of added paraffin. As this represented only about 4 per cent. on the wharf sample it was barely detectable in the bulk. When the whole consignment was garbled, nine bags were found to consist almost entirely of this adulterated wax.—J. Soc. Chem. Ind.; through Pharm. J., 96 (1916), 165.

Cod Liver Oil.—*A Hydrocarbon in.*—At a meeting of the London Chemical Society, A. C. Chapman reported that a sample of Lisbon cod liver oil examined by him contained 89 per cent. of unsaponifiable matter. It was supposed at first that this was added mineral oil but it turned out to be a hydrocarbon, $C_{28}H_{52}$, distilling at 280° at 17 mm. pressure. With bromine it yielded a compound having the formula $C_{28}H_{46}Br_6Br_6$; its hydrocarbon absorbed 6 atoms of bromine, while another six atoms replaced six hydrogen atoms. This hydrocarbon Mr. Chapman called *spinacidene*,

since obtained from the oil of livers of certain members of the subfamily Spinacidæ of the Cetacea.—Chem. and Drug., 88 (1916), 1242; also Pharm. J., 97 (1916), 571.

Cod Liver Oil.—*A Hydrocarbon in.*—H. Mastbaum comments the shipment of fish liver oil to London that was condemned as being adulterated with mineral oil. The author examined a portion of this oil and found it to contain 83 per cent. of unsaponifiable fat. Endeavoring to trace the source of this, he has himself extracted the oils from the livers of fresh Mediterranean fish. It is stated that the oil obtained from two distinct species, Centrophorus granulosus and Scymnus lichia, contains no less than than 80 to 90 per cent. of unsaponifiable liquid hydrocarbons having all the characters of mineral oil. This fact is adduced as supporting the theory of the animal origin of petroleum.—Chem. Ztg.; through Pharm. J., 96 (1916), 327.

Egg-yolk.—*Coloring Matter of.*—The principal pigment of the yolk of egg belongs to the xanthophyll group of plant pigments. The hen utilizes comparatively little carotin in the coloring of the egg. The same pigments are present in the body fat and blood serum. When hens were fed on food rich in carotin but relatively poor in xanthophyll, no appreciable influence on the color of the yolks of the eggs was observed. When both carotin and xanthophyll-containing foods were withheld, the tint of the yolks became markedly paler. The color of the flesh and egg-yolks of fowls may, therefore, be controlled simply by giving or withholding xanthophyll containing foods.—J. Biol. Chem.; through Pharm. J., 96 (1916), 445.

Gelatin.—*Detection of Sulphur Dioxide in.*—G. Frerichs recommends the improvement of the test of the German Pharmacopœia, the defects of which are due to the method of moistening the iodized starch paper. He recommends that either ten times the present amount of potassium iodate be used in the paper, or that the paper be prepared by saturating with 1 per cent. starch solution and when about to be used moistening the dried starch paper with a freshly prepared potassium iodate solution (0.01 gramme in 10 to 12 drops of water).—Apoth. Ztg., 31 (1916), 223; through Chem. Abstracts, 10 (1916), 1250.

Honey.—*Source of Albuminoids.*—The albuminoids in honey are derived, according to Kuestenmacher, from pollen. Langer, however, holds that such is not the case, but that the albuminoids are derived from the bee. The author precipitated the albuminoids from honey by ammonium sulphate and prepared an antiserum from this precipitate. On now extracting the albuminoids from the pollen of the flowers of various plants, such as hazelnut, alder, heath, dandelion, etc., and preparing antisera from them, he found that these latter did not precipitate the antiserum prepared from the albuminoids from honey. This is regarded as conclusive evidence that the albuminoids are derived from the bee, probably from the saliva of the insect.—Biochem. Ztg.; through Drug. Circ., 60 (1916), 482.

Honey.—*Analysis.*—W. R. G. Atkins determines the sugars usually found in ordinary honey, by oxidation with bromine of the aldehydic glucose, which leaves untouched the ketonic fructose. This fructose may then be determined separately by the usual polarimetric or reduction methods, giving thus a direct determination of one of the sugars instead of the usual, and, probably in the case of such a sugar, the less accurate method of indirect estimation of two simultaneous equations.—Pharm. J., 97 (1916), 571.

Lecithin.—*Composition of the Crude Form.*—H. McLean states that phosphatides extracted by alcohol from animal tissues contain nitrogenous impurities, which are extremely difficult to remove by any of the ordinary methods of preparing "lecithin." The crude lecithin obtained thus is a mixture of true lecithin, in which the whole of the nitrogen present is in the choline molecule, and cephalin, which contains no choline, and in which all the nitrogen is in the form of amino-ethyl alcohol. These two compounds may be separated by precipitation as cadmium compounds, and extracting the precipitate with ether. A method is given for preparing a partly purified lecithin from alcoholic extracts of heart and kidney tissue or egg-yolk by means of repeated precipitation with acetone and frequent re-solution in alcohol and ether.—Biochem. J.; through Pharm. J., 96 (1916), 273.

Milk.—*Acetone in.*—Engfeldt states that a minute but measurable quantity of acetone is a normal constituent of milk. Mares' milk contains from 0.48 to 0.97 milligrammes per liter; ewes' milk from 0.48 to 0.68 milligrammes; goats' milk, 0.97 to 1.45 milli-

grammes; cows' milk, 1.45 to 2.42 milligrammes; and human milk from 0.48 to 1.10 milligrammes per liter. The acetone was determined by diluting the milk with twice its volume of water, precipitating the caseine by means of a ten per cent. solution of tannin, and distilling slowly a portion of the aqueous filtrate. In this the acetone was estimated colorimetrically or by Messinger's iodometric process.—Svensk Farm. Tidskrift; through Pharm. J., 96 (1916), 521.

Milk.—*Bacteria and Dirt in.*—H. C. Campbell finds that the quantity of sediment or dirt collected when milk is strained through a cotton disc affords no criterion of the number of bacteria present. A milk showing but little foreign suspended matter or dirt may contain one million bacteria per mil; yet the number of germs present in a dirty milk may be as low as 7,000 per mil. Since the sediment test has been generally applied, producers have become accustomed to strain their milk before delivery. The test is therefore only useful to detect actual dirt.—Bull. U. S. Dept. Agric.; through Pharm. J., 97 (1916), 463.

Milk.—*Composition of Different Varieties.*—Goats' milk is said by A. W. Bosworth and L. L. Van Slyke, to differ from cows' milk (1) in containing tricalcium, dimagnesium and trimagnesium and monopotassium phosphates, and (2) in containing no monomagnesium or dipotassium phosphates. Human milk differs noticeably from cows' and goats' milk in containing no insoluble phosphates, but only the soluble compounds, monomagnesium and monopotassium phosphates. The phosphates in human milk are much less in amount than in cows' or goats' milk. All three milks contain potassium citrate, while cows' milk and human milk contain sodium citrate also. Chlorides are present in goats' milk in much larger amounts than in cows' milk or human milk; the amount in cows' milk is considerably larger than in human milk. In cows' milk and human milk the chloride appears to be calcium chloride, while in goats' milk potassium and sodium chlorides are also present. The total amount of salts in human milk is about one-third that in cows' milk or goats' milk. The number of different salts appears to be greatest in goats' milk and least in human milk.—J. Biol. Chem.; through J. Am. Med. Assoc., 66 (1916), 1057. (W. A. P.)

Milk.—*Detection of Preservatives and Artificial Coloring Matter in.*—In a detailed article J. M. Kolthoff reviews the various methods recommended for the detection of preservatives and artificial

coloring material and on the strength of his experiments he arrives at the following conclusions: Formaldehyde can be detected in the milk directly by Hehner's reaction with phenolsulphonic acid. Hydrogen dioxide is detected with vanadic-sulphuric acid and carbonates by estimating the alkalinity before and after boiling. Azo-dyestuffs and butter coloring are detected by the addition of acid while annatto is found by placing into the slightly alkaline liquid a piece of filter paper which will be colored brown when that dye is present. The brown color changes to pink by the addition of hydrochloric acid and to rose-red when the paper is moistened with stannous chloride solution. For detecting other preservatives, 100 mils of the milk are heated with 2 mils of acetic acid for 10 minutes in a water-bath and the mixture is then filtered. 50 mils of the filtrate are shaken out with 10 mils of ether, the ethereal solution is evaporated at gentle heat and the residue examined for salicylic acid with ferric chloride and for benzoic acid according to Mohler-Halphen. The serum is evaporated, the residue incinerated and the ash examined for boric acid. The curd is examined for coloring principles in the usual way. A part is dried, mixed with sodium carbonate and incinerated. The residue is examined for fluoric acid. Two mils of the filtered serum are examined with 8 mils of Tillmann's reagent for nitric acid.—Pharm. Weekblad, 53 (1916), 1609. (H. E.)

Milk.—*Persistence of Hydrogen Dioxide in.*—Hinks states that unqualified statements as to the persistence of hydrogen dioxide in milk are of no value. He finds it is a question of the age and condition of the milk. He cites one case where 0.2 per cent. added to a perfectly fresh milk was still present in estimable proportion after 18 months. Temperature is another factor influencing persistence. —Drug. Circ., 60 (1916), 702.

Milk.—*Preparation of Sugar-Free.*—According to a German patent, sugar-free milk is prepared by dialyzing homogenized milk in thin layers at about 60°. At this temperature the sugar disappears very rapidly (mostly within 4 hours) so that the milk does not become spoiled and only very little cream separates. Milk thus obtained can be sterilized by boiling and contains the total amount of fat and caseine. The milk can then be brought to the original volume by evaporation and be mixed with the necessary salts (which have been lost in the dialysis), sweetening agents, etc.—Chem. Tech. Rep.; through Pharm. Weekblad, 53 (1916), 203. (H. E.)

Musk.—*Loss of Weight.*—The sensation of smell is supposed to be due to particles of the odorous substance carried by the air to the nose. A very minute quantity can be detected by the nose, a part of musk in 10 million of air and 1 part of mercaptan in 50 billion of air. Reference books state that musk gives off its odor for years, without losing any weight at all. Dr. C. B. Bazzoni in a scientific research with a quartz micro-balance found that musk lost 14 per cent. of its weight in 7 months. Besides that, it lost its odor, which could not be restored by moistening or crushing or exposure to the open air.—J. Frank. Inst.; through Sci. Am., 1916, 173. (O. R.)

Spermaceti.—*Specific Gravity of.*—Ten samples of spermaceti showed a specific gravity varying from 0.931 to 0.949 according to P. E. Lundin. The estimations were made by the hydrostatic process, using diluted alcohol as immersion liquid. This method, the authors claim, gives more satisfactory results than the floating method adopted by most pharmacopœias.—Farm. Revy; through Pharm. Weekblad, 53 (1916), 1000. (H. E.)

Spermaceti.—*Test of the German Pharmacopœia Inadequate.*—G. Frerichs finds the pharmacopœial tests unsatisfactory and prefers Hager's ammonia test, which consists of heating 1 gramme of the sample with 10 mils of ammonia water and then adding hydrochloric acid to the filtrate, when no precipitation should occur. This test gives a distinct cloudiness if even 1 per cent. of stearic acid is present. Paraffin may be detected by the fact that 0.5 gramme pure spermaceti is completely soluble in 25 grammes of boiling absolute alcohol. The acidity test (titration with tenth-normal alkali) is a good way to detect the presence of stearic acid.—Apoth. Ztg., 31 (1916), 209; through Chem. Abstracts (1917).

Toad Venom.—*Constituents of Chinese.*—S. Shimizu finds that the drug known as "Senso," composed of the dried venom of a species of toad, contains cholesterol, the bufagin of Abel and Macht; bufotoxine, and a base resembling epinephrine. Bufagin causes a marked rise of blood pressure, and acts as a diuretic. It is toxic in small doses. Bufotoxine acts as a local anesthetic, causes convulsions of the medullary type, and is pharmacologically allied to picrotoxin. The base, resembling epinephrine, is a powerful sympathicomimetic poison.—J. Pharmacol.; through Pharm. J., 97 (1916), 413.

INORGANIC CHEMISTRY

A—GENERAL SUBJECTS

ATOMS AND MOLECULES.

Molecular Transformations in Precipitates.—As is well known to the analytical chemist a precipitate resulting from the reaction between two chemicals may have distinctly different properties according to the conditions under which the reaction has occurred. A. Villiers has studied the problem and concludes that the first stage of the precipitation is an unstable form called by him the *protomorphic state*. He finds temperature and degree of dilution are important factors in determining the character of the precipitate and finds that congelation of the reacting mixture produces instantly as great a modification in a precipitate as will be produced in 20 years in an uncongealed sample.—Annales de Chimie; through J. pharm. chim., 14 (1916), 49.

Molecular Association.—It is known that hydroxy compounds give abnormal molecular weights when tested by the boiling point method, using benzene or other solvents which are accepted as "associating solvents." W. R. Innes has now tried the effects of using high concentration and the vapor pressure of the solutions as a means of determining the molecular weights. The results are similar to those in dilute solutions. In some instances temperature has a marked effect, and it is found that certain groupings have a strong influence upon the power of molecular associations. Further, substances closely related to the solvent give normal results. Since when working in concentrated solution there can be little or no combination between solvent and solute, the only explanation of the abnormal molecular weight is one of the association of the molecular, and this association must be mutual between solvent and solute, hence the solvents hitherto assumed to be unassociated must under these conditions become associated.—Chem. and Drug., 88 (1916), 45. (K. S. B.)

Molecules.—*Shape.*—T. Snedberg, by using the anisotropic substance azoxyphenetol as a solvent, and by measuring the electrical conductivity of a dissolved electrolyte, or the velocity of diffusion of a dissolved non-electrolyte in directions parallel to, as well as at right angles to, the direction of the axes of the solvent molecules, found it possible to calculate the ratio between the two

axes of the solute molecules, assuming that these molecules consist of rotation ellipsoids. The measurements are made at various temperatures below that of the clearing-point of the solvent. Using phenol, ortho-nitrophenol, quinol, and pyrogallol as solutes, the axial ratio of the benzene molecules was found to be 1.63. With β-naphthol and sodium α-dinitronaphthol as solutes, the axial ratio for the $C_{10}H_8$ molecule was calculated as 2.93. If it is assumed, among other things, that the C_6H_6 and $C_{10}H_8$ molecules are ellipsoid in form, it can be calculated that the relative lengths of their major axes are 1 : 1.79; that is, numbers are obtained which are in agreement with the ratio 1.63 : 2.93 of the numbers given above.—Arkiv. Kem. Min. Geol.; through Pharm. J., 96 (1916), 445.

PHYSICAL CHEMISTRY.

Crystals.—*Imbibed.*—By this phrase, P. Gaubert designates those which are formed of a single kind of crystalline particles, which contain a foreign substance, in the amorphous state, in the crystalline lattice. Whenever the forms of a crystal are modified by the influence of a foreign substance in the mother liquor this substance passes into the crystal. Most of those impurities which modify the forms of ammonium chloride, or ammonium bromide crystals, are metallic chlorides or bromides, and have, therefore, a radical in common with the crystals. The minimum quantity of a foreign substance which must be present in the mother liquor to affect the form of the crystal is very variable. Generally, the higher the coefficient of solubility the larger the amount which must be present in the solution; but there are a number of exceptions to this rule. Very small amounts of foreign salt are sufficient to affect the crystalline form. The optical properties of the crystals are modified by the substance imbibed, the double refraction usually being increased. The strong absorption observed in crystals containing chlorides is not due to pleochroism alone, but also to the fact that the crystal is made up of very thin layers (pseudo-pleochroism). Percussion and compression produce birefringence and pleochroism.—Bull. Soc. franc. Min.; through Pharm. J., 97 (1916), 463.

Crystals and X-Rays.—*Their Bearing on Chemistry.*—The basis of this work was laid by Van Laver when he discovered that crystals could behave towards X-rays as a diffraction grating does towards ordinary light. W. H. Bragg brings out some of the more recent discoveries in an interesting article. The subject really resolves

itself into a study of the reflection of homogeneous rays from a series of parallel planes. In the special case the rays are those emitted from a rhodium anti-cathode in an X-ray bulb. It is based on the simplest ideas of interference. The actual planes which reflect are the planes of atoms in a crystal, and it is found that the distance between these planes is of the same order as the wave length of the X-rays. Thus the successive reflections come from planes, the distance between reflections being one wave length. This effect differs from the reflections of ordinary light in that the positions of the various reflections are definite and may be measured. The measurement is carried out by allowing the reflected rays to pass into a tube of methyl bromide, and the electricity developed by the resulting ionization is detected by means of an electroscope observed with a microscope. Using this instrument it is possible to measure the angle at which the different planes reflect and therefrom calculate the distance between the planes. It is found that atoms arrange themselves in a crystal in the same manner as would a pile of shot. A curious difference is found in the case of some isomorphous substances. Thus in the case of potassium and sodium chlorides, although the measurements show that each has the same symmetry, yet in the case of potassium chloride the intensity of the reflections from the various planes is the same, while with sodium chloride strong reflections alternate with weak. The explanation of this is found in the fact that the amount of rays reflected depends upon the weight of the atom. Thus, while potassium and chlorine are approximately equal in weight, sodium and chlorine differ considerably, hence the difference in intensity of the reflections of the sodium and chlorine planes. When a crystal is warmed, the intensity of the reflection diminishes, due to the increased rapidity of vibration of the atoms forming the reflecting planes, indicating that the atoms are not at rest.—Chem. and Drug., 88 (1916), 35. (K. S. B.)

Contraction Produced by Solutions of Salts.—A table presented with a paper by Albert Bolenbaugh summarizes the results of numerous experimenters on volume changes of a number of salts dissolved in water.—J. Am. Pharm. Assoc., 5 (1916), 38. (L. S.)

Simpson Light.—*Properties and Uses.*—The Simpson light, which is the light emitted from an electric arc formed between electrodes composed of a mixture of certain metals, the chief one being a tungstate of iron and manganese, is the subject of an article by

W. Douglas Harmer and E. P. Cumberbatch. The light is made up of the visible rays of the luminous spectrum and the heat rays and ultra-violet rays, being an extremely powerful source of the latter, to which its curative qualities are due. Its superiority to other sources of this ray is due to the presence of waves of shorter length. There are two forms of the Simpson lamp; in one the "open-arc" method and a plane mirror are used, and the electrodes are placed 12 to 15 inches from the skin. The light is applied two minutes to begin with and the exposure afterwards increased. The "focussed-arc" lamp has a parabolic reflector, and the area to be treated is placed at the focus of the reflected rays. Rodent ulcer, lupus, syphilitic ulceration and vaso-motor rhinitis have been treated with the light, while the white vapors given off by the lamp when in operation have been employed as an inhalation for asthma. Simpson light has been found to stimulate the healing of wounds and to give promising results in other cases in which it has been tried.—Lancet; through Chem. and Drug., 88 (1916), 46. (K. S. B.)

Solution and Crystallization.—*Physical Phenomena Pertaining to.*—H. J. Novack presents some interesting theories concerning solution and crystallization. His experimental work consisted of the microscopic study of crystal groups deposited upon a slide by deposition from saturated solution or by sublimation. He gives several illustrations of such crystal groups (or "primary crystalline particles" as he calls them) in the paper.—J. Am. Pharm. Assoc., 5 (1916), 964.

COLLOIDS.

Studies in Adsorption.—In a paper before the Scientific Section of the American Pharmaceutical Association, J. U. Lloyd summarized his work on adsorption phenomena during the last 37 years. He shows that his papers on percolation as contact action (1879), precipitates in fluidextracts (1881 and 1882), surface creeping deposits (1883), capillary phenomena (1884) and adsorptive power of selected inert substances (1885) foreshadowed his recent work on colloidal chemistry. He discusses W. L. Scoville's paper (Year Book, 1915) on filtration, showing that Scoville's conclusions and his are in entire accord; he then gives demonstrations of mixed solutions of the colored alkaloidal salts di-sanguinarine sulphate, di-berberine sulphate or else kryptonine with colorless alkaloids, such as quinine bisulphate, showing that when such solutions were passed through five layers of Whatman filter paper, the colored

alkaloid is adsorbed by the paper, while the colorless salt passes through with the fluid.—J. Am. Pharm. Assoc., 5 (1916), 1053.

Adhesion Alkaloidal Reactions.—At a meeting of the Philadelphia College of Pharmacy, J. U. Lloyd demonstrated the adsorption phenomena characteristic of his hydrated aluminum silicate reagent along the lines described in the abstract given above.—Am. J. Pharm., 88 (1916), 217.

Colloidal Solutions.—Edward H. Niles in a paper read before the Indiana Pharmaceutical Association gives a brief history of colloidal chemistry and then goes on to tell what colloidal solutions are, and how some of them may be prepared. He points out that in nearly all industries, colloids play the most important part and that already a number of metals in colloidal form are being manufactured and marketed in the United States and Europe. Therefore, he thinks it is evident that a knowledge of the properties and nature of colloids will greatly aid the pharmacist in handling them and in avoiding or overcoming incompatibilities.—Drug. Circ., 60 (1916), 697. (H. H. S.)

ANALYTICAL CHEMISTRY.

Acidimetry.—*Potassium Bicarbonate as Standard.*—G. Incze recommends to use potassium bicarbonate for standardizing acids. The salt has been used for over 30 years in the Hungarian laboratories and is very convenient for acidimetric determinations on account of its high molecular weight, not being hygroscopic and not being affected by the air. It is prepared by conducting carbonic acid gas into alcoholic caustic potash solution, the salt which separates is collected, is then dissolved in water, precipitated again by alcohol and recrystallized.—Z. anal. Chem.; through Pharm. Weekblad, 53 (1916), 448. (H. E.)

Color Standards and Colorimetric Assays.—Arny and Ring report further work on the standardized colored fluids devised by Arny. They give color readings (both with the Lovibond apparatus and the standard fluids) of Nessler's test, phenolsulphonic acid nitrate test, naphthylamine-sulphanilic acid nitrite test, Merck's and Folin's vanillin tests, Riegler uric acid test, ferric chloride-salicylic acid test and molybdate phosphoric acid test.—J. Ind. Eng. Chem., 8 (1916), 309.

Microvolumetric Analysis.—*Use in Determining Sulphates.*—H. J. Hamburger has devised a method of microvolumetric analysis of small quantities of sulphates. He uses a glass apparatus, the upper part of which consists of a small funnel, ending in a graduated tube closed at the other end. The precipitate is transferred to this tube without washing, then it is turned in a centrifugal machine until the volume of the precipitate no longer changes. He has determined small quantities of potassium in this way, and found that the exactness reached 0.000076 gramme of potassium. The sulphuric radical was determined with barium chloride, acetone being added. The error was not greater than 0.000294 gramme of SO_4. Some points have still to be cleared up, and the professor is working at these.—Chem. and Drug., 88 (1916), 1205.

Poison Analysis.—*Freezing as an Aid.*—G. A. LeRoy reports in "Annales des falsifications" a simple method of reducing the putrid animal matter, in which the poison is to be detected, to a state of fine subdivision. The animal organs are frozen and can then be cut, sawed or ground without any nauseous odors. By this method the animal matter can be easily reduced to a snow-like pulp or dry powder, perfectly homogeneous, having scarcely any odor and can be readily acted upon by the usual solvents and reagents. The author also recommends such congelation in laboratories for the analysis of alimentary, agricultural or pharmaceutical products. It facilitates the mechanical division of substances which are neither soluble or liquefiable, but have a pasty, fibrous or elastic consistency, such as meats, conserves, sausage, cheese, fruits, vegetables, etc.—Sci. Am., Sept. 23, 1916, 289. (O. R.)

Volumetric Assays.—A criticism of some of the volumetric assays of the British Pharmacopœia is given by Henry Stout.—Chem. and Drug., 88 (1916), 49. (K. S. B.)

Volumetric Solutions.—*Standardization of Large Quantities.*—A. H. Clark describes his method of solving the problem of preparing large quantities (20 to 40 liters) of standard volumetric solution for class use. The scheme consists in preparing any quantity of a solution (exact volume unknown) of such concentration that it is from one-fifth to one-tenth above normal, determining its factor by titration; diluting this solution with definite amount of water; determining the factor of a definite amount of this dilution; and then from the amount of water added at the second step and from two factors determined as above, deducing the amount of water that must be finally added to make the solution exactly normal.

The advantage of the method lies in the fact that the volume of the original solution need not be determined and that therefore only small graduated measures are required. Five formulæ required in the calculations are given in the original paper.—J. Am. Pharm. Assoc., 5 (1916), 706.

Laboratory Notes.—During researches upon atomic weights, Alexander Scott noted several points of interest which he presents. The first is the boiling point of bromine, one series of results differing by 5° C. Perfectly dry bromine was difficult to obtain. By distilling over anhydrous barium oxide, prepared from the hydrate, Scott obtained dry samples boiling at 57.9° C. at 739 mm. pressure. The density was 3.1893. A chlorine-free nitric acid was obtained by diluting with an equal volume of water and distilling with potassium permanganate. Pure silver was prepared by boiling a small amount of silver oxide in a solution of silver nitrate, thus removing metallic impurities, and then reducing the silver nitrate with ammonium formate.—Chem. and Drug., 88 (1916), 76. (K. S. B.)

COMMERCIAL CHEMISTRY.

Chemicals.—*Exports from the United States.*—During the 4 months ending April, 1916, the United States exported drugs, chemicals and dyes valued at $43,831,000.00, against $17,948,000.00 in 1915 and $8,688, 000.00 in 1914 during the corresponding months. —Chem. and Drug., 88 (1916), 946. (K. S. B.)

Surplus Stock.— *Utilization of.*—At the meeting of the Pennsylvania Pharmaceutical Association, Ivor Griffith cited instances of the pharmacist holding as "dead stock" chemicals that could be converted into other compounds that are today in great demand at high prices. In his paper, he gives working recipes for the conversion of salicylic acid into the sodium, ammonium, strontium and lithium salts; of benzoic acid into the sodium and ammonium salts; and bromine into potassium bromide. As to the latter, he states that a pharmacist in a Philadelphia hospital so utilized 20 ounces of bromine that had been discarded since the urease reaction has replaced the hypobromite method of urea determination.—J. Am. Pharm. Assoc., 5 (1916), 848.

Chemicals.—*Manufacture in America after the War.*—At the meeting of the National Association of Manufacturers of Medicinal Products, B. L. Murray discussed the past, present and future manu-

facture of chemicals in this country. He pointed out that no country had more raw materials than has this land, that we have some of the largest acid plants in the world, that our atmospheric nitrogen plants are developing satisfactorily, that the Department of Agriculture is doing great work toward the culture in this country of drug plants. Any handicap to chemical progress is largely due to the neglect on the part of the public of educational problems in the past, but the author believes that American chemistry is coming into its own and that the end of the war will find our chemical industries on a basis that will be able to stand foreign competition. —Pharm. Era, 49 (1916), 108.

War Chemistry.—In a lengthy address delivered at the annual meeting of the "Bernischen Hochschulverein," November 28, 1915, Professor A. Tschirch reviews in detail the accomplishments of chemistry in supplying the substances needed for food, explosives, etc. He also calls attention to the many discoveries the chemist is being asked to make to fill the voids caused by the great conflict. The author also discusses the conditions in neutral countries brought about by the war.—D.-A. Apoth. Ztg., 36 (1916), 149. (J. H.)

NON-METALLIC ELEMENTS

OXYGEN.

Hexavalent Oxygen.—In a paper communicated to the "Tübinger Chemische Gesellschaft" recently, C. Bülow expounded a new theory of chemical combination based on the hexavalency of oxygen. Working on the suggestion made by Walden thirteen years ago, that under special circumstances oxygen behaves as a hexavalent element in the same way as the other members of Group VI of the periodic system, Bülow arrives at the conclusion that each element has only one valency under all circumstances, and this valency corresponds with its place in the periodic system, which, he states, should be thoroughly revised. He is of opinion that carbon is tetravalent in all its compounds, nitrogen pentavalent, oxygen and sulphur hexavalent, and chlorine heptavalent. Hydrogen would be trivalent. The aggregates of the water molecule are considered to be different degrees of polymerization, between the unimolecular vapor, H_2O, and "inactive" ice, $(H_2O)n$. When ice is warmed it passes through several phases into vapor, the most active form being that in which the oxygen and hydrogen atoms are united by one bond only. In this phase the water molecules have eight free

valencies, and by still further raising the temperature the molecule is decomposed into oxygen atoms (hexavalent) and hydrogen atoms (trivalent). The author gives numerous graphic formulæ to illustrate this and other points, as well as of inactive and active "diaqua" (*i. e.*, having free bonds), "triaqua," "tetraquas" and "hexaquas." He believes that he has solved the problem of the theory of solution, and extends his theory to several other chemical problems, such as the formation of "double salts." The theories of stereo-chemistry, the differences between aliphatic and aromatic compounds, and the whole structure of chemical theory as taught at present are thrown over by the author.—Pract. Drug., Apr., 1916, 39.

Oxygen.—*For Inhalation.*—In connection with a breathing apparatus constructed for the Bureau of Mines, the following statements are made which are also of interest to pharmacists. In spite of the general belief that pure oxygen is unsafe to breathe, no abnormal effects attend its use, except a slight irritation of the bronchial passages, after prolonged use. The amount of oxygen consumed in the body is precisely the same when the gas is breathed in the pure state as when diluted with nitrogen in the form of air. There is no flushing of the face, no feeling of exhilaration, no increase in the pulse rate, nor elevation of arterial tension. It is only a few years since the reverse of each of these statements was believed.—Sci. Am., May 13, 1916, 507. (O. R.)

Oxygen.—*For Frost Foot.*—Dumarest advocates the repeated injection of oxygen in the treatment of frost foot. The first case treated was a very severe one, in which much of the tissues was gangrenous. Oxygen was injected into the lower third of each limb until from 2 to 3 liters were slowly introduced under the skin of each leg, and diffused by means of gentle massage for 15 minutes. Change of aspect of the affected parts was immediate. The next day the injection was repeated; all gangrenous odor had then disappeared. The treatment was repeated thrice at three days' interval. The necrosed tissues were eliminated, and the wounds healed well after dressing with aromatic ointment. The treatment tried subsequently in a number of cases has given excellent results.—J. Med. Chir. Pract.; through Pharm. J., 96 (1916), 133.

Hydrogen Dioxide.—*Reaction.*—If a dilute phenol solution be treated with a few drops of N/10 hydrogen dioxide solution and a freshly prepared N/100 ferrous sulphate solution be added an in-

tense green color is obtained. The color changes to reddish violet on addition of dilute alkali solution, but the green color reappears upon acidifying the mixture.—Z. anal. Chem.; through Chem. and Drug., 88 (1916), 70. (K. S. B.)

Hydrogen Dioxide.—*Assay.*—J. von Bertalan suggests a volumetric method depending upon the oxidation of stannous chloride, and the titration of the excess of stannous tin by standard iodine solution, according to the equations: $SnCl_2 + H_2O_2 + 2HCl = SnCl_4 + 2H_2O$; and $SnCl_2 + 2HCl + I_2 = SnCl_4 + 2HI$. The stannous chloride solution, if preserved in an oxygen-free atmosphere, is sufficiently stable, but it is desirable to perform a blank titration with standard iodine before each determination. In order further to exclude oxidation by molecular oxygen, the dioxide solutions are acidified with sulphuric acid, and about 2 Gm. of potassium bicarbonate added immediately before running in the known excess of tin solution.—Chem. Ztg.; through Pharm. J., 97 (1916), 27.

Hydrogen Dioxide.—*Action on Metals.*—E. Salkowski while examining urine for the presence of mercury noticed that chips of copper which had been placed in urine, in which the organic matter had been destroyed by means of acid and hydrogen dioxide, were strongly attacked and even dissolved. The author suspecting that the hydrogen dioxide was greatly increasing the dissolving power of the acid made the following experiments: He mixed 25 per cent. hydrochloric acid, sulphuric acid (200 Gm. per liter) and glacial acetic acid separately with $^1/_2$ to $^2/_3$ their volume of 30 per cent. hydrogen dioxide solution, and placed into these mixtures metal foils. It was found that the hydrochloric acid mixture, the action of which is due to the presence of chlorine, dissolved copper, lead, bismuth, nickel, gold, platinum and antimony; insoluble were mercury and silver. The sulphuric acid mixture dissolved copper silver, mercury, nickel and bismuth; tin, lead, gold, platinum and antimony were not soluble. In the glacial acetic acid mixture copper, silver, mercury, lead and bismuth were soluble; insoluble, however, tin, nickel, gold and platinum. With some metals one is in doubt whether they dissolve at all, because the product of reaction is difficultly soluble or insoluble. The term "soluble" used by the author is not strictly that which is meant by soluble in practice. The author believes that good use can be made of this reaction in the technique especially in dissolving larger quantities

of metals, because such a process eliminates the use of nitric acid and the formation of nitrous acid gases.—Chem. Zeit.; through Pharm. Weekblad, 53 (1916), 1266. (H. E.)

Iodized Hydrogen Dioxide.—*Decomposition on Aging.*—Since the war, the use of a mixture of solution of hydrogen dioxide (100 mils) with a 5 per cent. alcoholic solution of iodine (1 mil) has become quite popular in European hospitals. J. Khouri, appreciating the possibilities of decomposition of such a mixture, ran a series of titrations of the solution of hydrogen dioxide and of the mixture prepared from it. At the start, one mil of the dioxide solution absorbed 15.4 mils of tenth-normal potassium permanganate; in one day the iodized mixture absorbed only 14.9 mils of permanganate solution; in six days the straight dioxide solution absorbed 15.3 mils of permanganate solution, while the iodized dioxide solution absorbed only 12.6 mils; while after 265 days, the straight dioxide solution absorbed 10.6 mils of permanganate solution, while the iodized dioxide solution absorbed only 0.1 mil. The table given in the article gives the deterioration day by day.

The author draws no conclusions as to the character of the change occurring in the mixture, but he emphasizes that only fresh iodized dioxide solution should be used in wound treatment.—J. pharm. chim., 14 (1916), 356.

HYDROGEN.

Hydrogen.—*Technical Production and Industrial Uses.*—H. L. Barnitz gives an interesting account of the commercial aspects of hydrogen. He describes the Linde-Caro-Frank process of manufacture, which consists in chilling water gas with liquid air, until all of its constituents are liquefied except hydrogen; the Lane contact process, which consists in decomposing steam by passing it over reduced iron ore that has been brought to incandescence; and the Rinker-Wolter process, which consists in the decarburation of petroleum oils by spraying the oils into beds of hot cake. Hydrogen made by either of these processes cost from 54 to 61 cents a 1000 cubic feet in Germany and from 85 cents to a dollar per 1000 in this country, where there are now four plants in operation.—Am. J. Pharm., 88 (1916), 264.

Water.—*Detection of Chlorine in.*—G. A. LeRoy uses a solution of hexamethyltriaminotriphenylmethane hydrochloride for detecting chlorides in drinking water. In the presence of the minutest

trace of free chlorine, even as little as 1 : 300,000,000, it gives a violet color almost immediately. The reaction is not affected by the presence of nitrites nor by traces of hydrogen dioxide. The reagent is prepared by treating in the cold hexamethyltriaminotriphenylmethane, 1, with hydrochloric acid, 10, diluted with an equal quantity of water. When solution is complete the volume is made up to 100 with distilled water. One part of this reagent is added to 1,000 parts of the water to be tested. The addition of a few parts of sodium chloride intensifies the color. With some waters the reagent produces a turbidity; this is easily removed by acidifying the water with acetic or formic acid. As a precaution, this addition of acetic acid should always be made before adding the reagent.—Comptes rend.; through Pharm. J., 97 (1916), 277.

Water.—*Determination of Purification by Chlorination.*—J. Golse as "pharmacien aide-major" in the French army has studied the purification of drinking water for the army by chlorination (or "javellization"). To determine whether a sample of water has been sufficiently chlorinated is simple when chlorinated lime is the only chemical employed, for in such case the slightest traces of free chlorine will liberate iodine from potassium iodide. But it is the usual procedure to render such purified water more palatable by removing all traces of free chlorine by addition of small amounts of sodium thiosulphate and in this event the degree of purification must be determined not by the presence of chlorine, but by the presence of thiosulphates.

To accomplish this, Golse recommends two tests. The simplest is the addition of solution of silver nitrate, with which traces of thiosulphate reacts with the formation of a brown colloidal solution. If chlorides are present in the water the precipitated silver chloride must be redissolved by the addition of a few drops of ammonia water. If the quantity of thiosulphate is exceedingly minute, a more sensitive test is the decolorization of an iodine solution. The procedure consists in placing in a precipitating jar 100 mils of the water under examination and in another 100 mils of distilled water. To each is added the same quantity of potassium iodide, hydrochloric acid and benzene (la benzine), the latter forming a supernatant layer. To the two liquids is then added the same quantity of a solution of potassium iodate. The benzene layer on the mixture made with distilled water will assume the violet iodine color; the other mixture will have a colorless or only faintly colored benzene layer, if it has been sufficiently chlorinated.—J. pharm. chim., 14 (1916), 8.

Water.—*Roman Test for Alkalinity.*—M. Trillat says the ancient Romans tested the alkalinity of drinking water by adding red wine. One hundred mils of rain water are colored by 2 drops of wine, while alkaline spring water may require 30 to 35 drops.—Chem. and Drug., 88 (1916), 725. (K. S. B.)

Water.—*Sanitary Analysis of.*—Comte publishes a paper on water analysis in which he gives data concerning the waters of the Argonne district, where he is posted during the war.—J. pharm. chim., 14 (1916), 135.

Water.—*Sterilization by Carbon Dioxide under Pressure.*—H. Colin studied the conditions under which water contaminated with bacteria is sterilized by carbon dioxide under pressure (up to 25 atmospheres). It was found that not all bacteria are destroyed by carbon dioxide under 10 to 25 atmospheres. Bacillus coli communis was stable for 5 days under 25 atmospheres and Bacillus subtilis for 4 days. To be rendered sterile a water contaminated with Bacillus Eberth required over 20 hours under 10 atmospheres; 8 to 20 hours under 15 atmospheres; 3 to 9 hours under 20 atmospheres; 3 to 6 hours under 25 atmospheres. Bacillus dysenteriæ was destroyed in less than 15 hours under 15 atmospheres and in less than 6 hours under 20 atmospheres. A water contaminated with cholera bacilli was sterile in less than 10 hours under 10 atmospheres' pressure. Bacillus pyocyaneus required 48 hours under 18 atmospheres. A water contaminated with diptheria bacilli was rendered sterile in 24, 9, and 3 hours under pressure of 10, 15 and 20 atmospheres, respectively; with 25 atmospheres it was immediately sterile. The putrefactive bacteria of the river Seine were found resistant for a fairly long time toward carbon dioxide under low pressure, but 25 atmospheres' pressure destroyed them in a few few hours.—Compt. rend.; through Apoth. Ztg., 31 (1916), 652. (J. H. W.)

Ozonized Isotonic Sea-Water.—*Use as Wound Antiseptic.*—R. Guyot writes in very enthusiastic terms of the use of ozonized sea-water in the treatment of wounds. He claims that sea-water is a natural isotonic solution; that it is almost sterile; that in breaking as surf it forms finely divided surfaces for the absorption of ozone found in sea air. Pharmaceutically the idea is applied by filtering sea-water through a Chamberland filter and then saturating it, in the form of drops, with ozone, produced from ozonizing apparatus described in the paper.—J. pharm. chim., 14 (1916), 41.

HALOGENS.

Chlorinated Lime.—*Quality.*—J. P. Street reports that of twenty-five samples of chlorinated lime (bleaching powder) which, according to the United States Pharmacopœia, should contain "not less than 30 per cent. of available chlorine," only three were found of full strength. Eight contained but traces of available chlorine. This is a dangerous situation when it is recalled that the public as well as the medical profession puts great dependence on the disinfecting powers of this inexpensive material.—J. Am. Med. Assoc., 67 (1916), 695. (W. A. P.)

Chlorinated Lime.—*Sterilizing Grain with.*—J. Wilson shows that a clear solution of chlorinated lime, containing 2 per cent. of chlorine or hypochlorite, is a superior germicide for seeds than mercuric chloride or formaldehyde. The seeds are dipped into 5 volumes of solution and are allowed to remain from 6 hours (buckwheat) to 12 hours (wheat). It is not necessary to wash the seeds with water, as traces of hypochlorite solution do not affect germination.—Sci. Am., Sept. 30, 1916, 297. (O. R.)

Hypochlorites.—*Assay of.*—Comte discusses the volumetric assay of chlorinated lime, Javel water and Dakin's solution with tenth-normal sodium thiosulphate by the usual iodometric method. He obtains the French "chlorometric degree" of chlorinated lime by multiplying the number of mils of tenth-normal thiosulphate solution required by 0.1 gramme of the sample by 11.20. The English chlorometric degree is obtained by using for the foregoing quantities the factor 3.55.—J. pharm. chim., 14 (1916), 232.

Hypochlorites.—*For Infected Wounds.*—Dakin points out that he claims no credit for the "discovery" of the "new antiseptic." He explains that the "new antiseptic" was discovered by Berthollet in 1788. The solution used by Dakin and others is essentially the well-known Labarraque's solution or solution of chlorinated soda. The claims as to the efficiency of the various modifications which are being used in France and England are decidedly contradictory. The one conclusion which all results with the various hypochlorite solutions appear to justify is that hypochlorites, whether applied in an acid solution, in an alkaline solution or in a neutral solution, are of genuine value in the treatment of infected wounds.—J. Am. Med. Assoc., 66 (1916), 430. (W. A. P.)

Magnesium Hypochlorite.—According to C. Mayer, this chlorinated product is less caustic than sodium hypochlorite, while it is a powerful disinfectant, and is very cheap. It may conveniently be prepared by dissolving 190 Gm. of magnesium sulphate in 2 liters of water and mixing with 2 liters of water into which 100 Gm. of chlorinated lime have been stirred. The mixture is allowed to settle, and when decanted it is ready for use. As it is tolerated perfectly by the tissues, it can be used freely. The organism bears magnesium well, much better than free sodium or lime.—Paris Med.; through Pharm. J., 96 (1916), 401.

Chlorinated Physiological Solution.—*Preparation.*—Cruet and Rousseau make such a solution by exhausting 25 Gm. of chlorinated lime with sufficient water at 50° C. to produce 1,000 mils. After filtration, 8 Gm. of sodium chloride and 12 Gm. of magnesium chloride are dissolved in the liquid, which is then made neutral or very faintly acid to litmus by the cautious addition of 2 or 3 Gm. of syrupy lactic or phosphoric acid. The precipitated lime salt is removed by filtration, and the filtrate used as an antiseptic dressing or irrigation liquid, either cold or tepid, undiluted, or mixed with physiological solution.—J. pharm. chim.; through Pharm. J., 96 (1916), 223.

Bromine and Iodine.—*Determination in Presence of Chlorides.*—The investigations of L. W. Winkler show that by the use of potassium permanganate the bromine ions in a solution may be exactly determined in the presence of much chloride. The procedure varies, depending upon whether much or little bromine is present. For the exact determination of very small amounts of bromine the bromometric method is best, in which the free bromine dissolved in carbon tetrachloride is determined by arsenic trioxide solution, using iodine as indicator. The methods for the determination of iodine were tried. The method of Grange-Fresenius, whose exactness was further increased, deserves special mention.—Z. angew. Chem.; through Pharm. Ztg., 61 (1916), 49. (J. H. W.)

Metallic Bromides.—*Properties of.*—I. Guareschi describes *manganese bromide*, $MnBr_2.4H_2O$; *beryllium bromide*, $BeBr_2$, decomposes on heating in moist air; *zinc bromide*, $ZnBr_2$, boils at 695–699° without decomposition; *cadmium bromide*, $CdBr_2$, sublimes at the boiling point with slight decomposition; *mercuric bromide*, $HgBr_2$, sublimes without decomposition; and *cupric*

bromide, decomposes on heating.—Atti. accad. sci. Torino; through J. pharm. chim., 13 (1916), 55.

Dilute Hydrobromic Acid.—*Preparation from Potassium Bromide.*—O. E. Bennett shows that hydrobromic acid can be prepared by treating potassium bromide in solution with sulphuric acid and distilling, the net yield being 72 per cent. of the theoretical. The residue contains some potassium bromide and not potassium acid sulphate alone. If sulphuric acid is added in too great concentration, bromine is liberated in the solution and is found also in the first distillates, though later ones are colorless. Three ounces of sulphuric acid diluted to 12 fluidounces and cooled, then mixed with a solution of potassium bromide made by dissolving 6 ounces in water to make 18 fluidounces proved sufficiently dilute. Submitted to fractional distillation an acid of over 60 per cent. *w/v* is obtained. This last distillate is free from sulphurous and sulphuric acids. Capillary tubes in the liquid prevent "bumping" except that caused by separation of crystals which takes place suddenly and in rather large quantities.—Pharm. J., 97 (1916), 293. (Z. M. C.)

Hydrobromic Acid Gas.—*Density.*—E. Moles determined the density of hydrogen bromide, which was prepared by two methods: Firstly, by the reaction $Br_3P + 3H_2O = H_3PO_3 + 3HBr$, and, secondly, by the reaction $Br_2 + H_2S = S + 2HBr$. In both cases the excess of bromine was removed by cooling, and after having been dried the gaseous HBr was condensed by means of liquid air and fractionally distilled. The mean value of the density was then found to be 3.6444 Gm. per normal liter.—Compt. rend.; through Chem. News, 113 (1916), 300.

Iodine.—*Russian Production.*—The Russian Colonization Department has assigned $60,000 for the erection of a plant at Nahodaka Bay to recover iodine from sea-weed. Eight hundred boats have been ordered for the purpose of gathering the sea-weed by means of hooks.—Chem. and Drug., 88 (1916), 953. (K. S. B.)

Iodine.—*Percentage in Sea-Weed.*—L. van Itallie and J. van der Zande have examined Zostera marina for the amount of iodine present and have found the dried plant to contain 0.00048 per cent. of soluble iodine and 0.0019 per cent. of total iodine. This shows that, technically, iodine cannot be produced from sea-weed.—Pharm. Weekblad, 53 (1916), 705. (H. E.)

Iodine.—*Substitutes in Wound Dressing.*—Where iodine is unobtainable, a 5 per cent. solution of bromine in chloroform may be used. In case of necessity the chloroform may be replaced by carbon tetrachloride. This solution sterilizes the skin even in the deeper layers and can take the place of tincture of iodine in the treatment of wounds. For the disinfection of operation sites, Schumacher recommends the use of two solutions, one containing two parts of potassium iodide in ten parts of dilute alcohol, and the other containing the same proportion of ammonium persulphate in the same liquid. The first solution is painted on the skin by means of a pledget of cotton and is followed by the second solution. The reaction is complete after 50 seconds, the yellow color which appears at first soon changing to brownish red. The iodine being in a nascent state is more active than iodine tincture, and the two solutions being kept separate are more stable than the tincture.—Schweiz. Apoth. Ztg.; through Pract. Drug., Sept., 1916, 39.

Iodine and Sodium Salicylate.—*Incompatible Mixture of.*—J.R. Hill discussed a prescription calling for 6 drachms of tincture of iodine, 6 drachms of solution of potassa, 3 drachms of ammonium carbonate, 2 drachms of sodium salicylate and enough compound decoction of sarsaparilla to make 20 ounces. This mixture he calls "an unusual accumulation of incompatibilities. The tincture of iodine and the solution of potassa may form (*a*) potassium iodide and iodate (*b*) iodoform. The solution of potassa liberates ammonium from the ammonium carbonate and this ammonia may form nitrogen iodide with the iodine or may make the usual black compound with sodium salicylate. The sodium salicylate reacts with the tincture of iodine to form tri-iodophenol iodide, sodium iodide and hydriodic acid.—Pharm. J., 66 (1916), 397.

Hydriodic Acid.—*Antiseptic Properties.*—According to R. Lettieri hydriodic acid is a most excellent disinfectant for wounds. He claims that the presence of this acid in an old sample of tincture of iodine, is responsible to a great extent for the superiority of its action when compared with that of a freshly prepared sample. He calls especial attention to the anti-putrefactive properties of this acid. He employs the acid in the form of a 2 per cent. wash, and in the form of a 0.50 per cent. gauze.—C. U. C. P. Al. J., 23 (1916), 35. (G. C. D.)

Fluorine.—*New Method of Determination.*—F. Pisani finds that when a solution of thorium nitrate is added to a solution of an alkali fluoride, slightly acidified with acetic acid, an abundant bulky gelatinous precipitate of thorium fluoride, $ThFl_4 + 4H_2O$, is formed resembling alumina in appearance. This readily subsides, so that it may be washed by decantation, collected, and dried at 100° C. At this temperature it loses 3 mols. H_2O, and the $ThFl_4 + H_2O$ may be weighed as such. It is preferable, however, to incinerate the precipitate strongly, and to weigh the residual thoria, ThO_2, one molecule of which is equivalent to 4 molecules of fluorine. Insoluble fluorides may be decomposed by fusion with sodium carbonate, and the fusion mass extracted with water. The alkaline liquid is then acidified with acetic or nitric acid, and treated as above. If phosphates are present, the alkaline solution obtained after fusion is first neutralized with nitric acid and the phosphoric acid removed by any of the familiar methods of precipitation. The fluoride is then determined in the filtrate. Care should be exercised not to use a large excess of thorium nitrate, since the precipitate is slightly soluble therein. From 0.2 to 0.3 Gm. of material is a convenient quantity to operate on, for quantitative determinations. When the amount of fluorine present is below 1 per cent. time must be allowed for the aggregation of the precipitate. The delicacy of the reaction is considerable; a distinct precipitate is obtained with a dilution of fluorine 1 : 10,000.—Compt. rend.; through Pharm. J., 96 (1916), 623.

SULPHUR AND POLONIUM.

Sulphur.—*Poisoning by the External Use of.*—Neumaijer reports that a soldier who had rubbed his body with milk of sulphur for the removal of lice suffered from strong diarrhea which lasted for three days and was accompanied by severe cramps. By the internal application of bolus and animal charcoal the illness could easily be relieved.—Münch. Med. Wochschr.; through Pharm. Weekblad, 53 (1916), 38. (H. E.)

Sulphides.—*Estimation of Small Quantities.*—The ordinary methods for the estimation of sulphide sulphur require considerable time and with small quantities are not very accurate. W. A. Drushel and C. M. Elston have developed a rapid colorimetric method of estimating very small amounts of sulphide sulphur with a fair degree of accuracy which consists essentially of the comparison of the depth of color of lead sulphide stains obtained from

the sulphide sulphur of a given weight of a substance with a standard series of stains prepared from sulphide solutions of known sulphur content. A set of stains varying in color from a faint yellowish brown to black, representing from 0.0002 per cent. to 0.004 per cent. of sulphide sulphur, may be prepared and used indefinitely for comparison.

The apparatus used is very simple. The inner tube of a Liebig condenser, with its larger end about 18 mm. in diameter, was cut off 15 cm. in length. The smaller end was drawn down somewhat, rounded, and fitted to a sound cork, which in turn was fitted to a 100 mil round-bottom flask. The condenser tube served as a sort of reflux condenser. To the larger end of the tube a filter paper moistened with a dilute solution of lead acetate was smoothly fitted and tied, so that the steam passing up through the tube and carrying hydrogen sulphide was required to pass out through the lead acetate paper. A similar tube, with the internal diameter of its larger end about 36 mm., was used for samples containing 0.001 per cent. or more of sulphur. A measured portion of the solution is placed in the flask, 25 mils of 0.5 per cent. hydrochloric acid added and the flask immediately closed with the cork containing the condenser tube fitted with the lead acetate paper. The mixture is gently boiled for a few minutes at such a rate that the steam issues not too rapidly from the upper end of the tube. The undecomposed lead acetate is washed from the paper and the paper dried.

The method is said to be very rapid and results of experiments demonstrating its accuracy are given. The authors have shown its usefulness in gas, coke and paper analysis. Am. J. Science; through Chem. News, 114 (1916), 272. (J. A. K.)

Aromatic Sulphuric Acid.—*Assay.*—W. S. D. Penniman, W. W. Randall, C. O. Miller, and L. H. Enslow comment upon the official process of assay as follows: In order that complete hydrolysis of ethylsulphuric acid may be effected, when this is heated with water, it is necessary that the alcohol formed be removed. In case of aromatic sulphuric acid, no appreciable hydrolysis of the ethylsulphuric acid takes place, until nearly all of the free alcohol has been expelled. For this reason, methods such as given in the U. S. P., in which the sample is diluted with water and then heated under a reflux condenser, always show low results. Complete hydrolysis can be effected in most cases by heating the sample with six times its volume of water, and heating in an open vessel on a water-bath, strongly boiling, for a period of at least 4 hours.—J. Ind. Eng. Chem., 8 (1916), 904.

Persulphuric Acid and Persulphates.—*Use as Anti-Gonorrheics.*—J. Schumacher reports that a 3 to 5 per cent. solution of ammonium persulphate gives good results in the treatment of gonorrhea. The gonococci are not killed as rapidly as by silver salts. When, however, the solution is acidulated with sodium bisulphate, persulphuric acid is formed which is just as active as the various silver salts. Dermatol. Woch.; through Pharm. Weekblad, 53 (1916), 1650. (H. E.)

Polonium.—*Compound with Hydrogen.*—R. W. Lawson finds that when a film of polonium is kept in a vessel filled with hydrogen the number of ions at any given distance from the film gradually increases as time goes on. The easiest explanation of this is based on the assumption that hydrogen and polonium slowly enter into combination to form a compound. If this compound is a gas it will diffuse throughout the whole of the containing space, and consequently the ionization at a given distance will be increased, owing to the greater propinquity of a number of disintegrating atoms. This explanation seems to be entirely reasonable, as polonium is the fifth member of the oxygen, sulphur, selenium, tellurium group, of which each element readily forms a gaseous compound with hydrogen.—Monatsh.; through Pharm. J., 97 (1916), 7.

NITROGEN AND RARE GASES.

Nitrous Acid.—*Significance and Detection in Water.*—In his work H. Klut discusses the occurrence and production of nitrous acid in water and further deals with its significance from a hygienic and from a commercial standpoint. It is mentioned that the occurrence of nitrous acid in water is not always to be looked upon as a sign of contamination; the origin of its presence should be investigated. Nitrite-containing waters, however, are not serviceable in the textile and fermentation industries.

For the detection of nitrous acid in water the reagents mostly used are zinc-iodide-starch solution, metaphenylendiamine, sodium naphthionate and betanaphthol, α-naphthylamine and sulphanilic acid. For hygienic and most other purposes the reaction with zinc-iodide-starch suffices. For the test a test-tube is filled $^3/_4$ full with the water, 3 to 5 drops of 25 per cent. phosphoric acid added and then 10 to 12 drops of zinc-iodide-starch solution. If nitrous acid is present, the liquid turns blue more or less rapidly depending on the amount. A bluing of the solution occurring more than 15

minutes after the test is performed may be due to other influences and should be disregarded.—Hygienen. Rundsch.; through Pharm. Ztg., 61 (1916) 107. (J. H. W.)

Nitrohydrochloric Acid.—*Reactions of Production.*—E. Briner states that although aqua regia has been known and used since the eighth century very little attention has been paid to the mechanism of its reactions. The chief aim of the present work was to establish the reversibility of the reaction $HNO_3 + 3HCl = NOCl + Cl_2 + 2H_2O$. From recent observations it might be foreseen that when reacting in a closed vessel the acids would give rise to a liquid phase containing NOCl and Cl_2 co-existing in equilibrium with the aqueous phase. This has been proved experimentally to be the case. In order to ascertain the conditions of equilibrium the author has constructed a series of glass apparatus provided with a compressed air manometer and an electromagnetic agitator, and containing different proportions of the acids of varying concentrations. It was thus proved that the pressure was the same in all the apparatus, and within the limits in which the author worked the system is monovariant, having three phases and two independent components. If the acids are too dilute the liquefied gas phase does not exist, and the pressures decrease as the dilution increases. The reaction is endothermic, and in order to encourage the liberation of chlorine it is best to raise the temperature, the heating being stronger the more dilute the acids. When the two acids are mixed it is found that the temperature first rapidly rises some degrees and then slowly descends, remaining about 2° below their temperature before mixing, which proves that heat is absorbed during the reaction. The rise of temperature at the beginning is due to the action of the HCl upon the water of the solution of HNO_3, the heats of solution and dilution of this acid being low in comparison with those of HCl. It was found that when some drops of water, representing the water contained in the solution of HNO_3, were added to a solution of HCl the temperature rose about 5°.—Compt. rend.; through Chem. News, 113 (1916), 215.

Ammonia.—*Determination of Naphthalene in.*—S. Hilpert uses the picrate method. A known quantity of the solution is cooled in ice-water, neutralized by the gradual addition of sulphuric acid, the cooling being maintained during the process. The liquid is then distilled and about 30 mils of distillate collected. The distillate is extracted with ether, and the condenser also rinsed out with

the liquid; the mixed ethereal solutions are treated with excess of N/20 solution of picric acid. After the lapse of two minutes, the ether is evaporated under reduced pressure, the residual aqueous solution is cooled in ice-water, the precipitate collected on a filter, washed with 5 mils of ice-water, and titrated with N/10 solution of sodium hydroxide, using litmus as indicator.—Z. angew. Chem.; through Pharm. J., 96 (1916), 525.

Ammonia.—*Detection of Pyridine in.*—According to Woelk when 0.25 to 0.5 gramme of a dry ammonium salt is triturated in a porcelain mortar with double the quantity of borax an empyreumatic odor will be developed when pyridine is present. For detecting pyridine in ammonia water, 10 mils of 10 per cent. hydrochloric acid are mixed with 4.8 mils of 10 per cent. ammonia water or 2 mils of stronger ammonia water, the mixture is evaporated to dryness and with the residue the above test is made.—Ber. pharm. Ges.; through Drug. Circ., 60 (1916), 146.

Ammonium Carbonate.—*Composition of Commercial.*—Wiebelitz reports that an ammonium carbonate is put on the market which is a true salt and not a mixture of approximately equal parts of ammonium carbonate and ammonium carbamidate. This new salt contains 21 per cent. of NH_3 and 55.7 per cent. of CO_2 and therefore corresponds to the formula NH_4HCO_3. The salt has the advantage over the old salt in being of constant composition, being more stable and containing a larger percentage of carbonic acid which makes it more desirable as ingredient of baking powders. In a dry state it is only slightly volatile, but when brought in contact with water it is just as volatile as the salt generally used. Pharm. Zeit.; through Pharm. Weekblad, 53 (1916), 1455. (H. E.)

"Noble Gases."—*The Six Elements Found in "Atmospheric Nitrogen."*—H. P. Talbot discourses interestingly on helium, neon, argon, krypton and xenon, which have been isolated by Lord Rayleigh and Sir William Ramsay from the impure nitrogen left after oxygen has been removed from air. The discovery of these elements and their properties are explained at some length and the work of Onne's in liquefying helium and thus obtaining a temperature of —269° is described.—Science Conspectus; through Am. J. Pharm., 88 (1916), 220.

PHOSPHORUS.

Phosphorus.—*Colored Modifications of.*—That red phosphorus can be obtained in two forms—bright brick-red and violet—has been pointed out by Smits. P. W. Bridgman in 1908 and 1909 showed that when white phosphorus was heated to 200° under 12000 kilogramme pressure, a black phosphorus was obtained. He now reports further work on the production of this modification, showing that the change takes place at an accelerated pace at 200° and 12000 kilos and that it will not take place with practical velocity at lower temperature and pressure. Red phosphorus treated similarly is not converted into the black modification.—J. Am. Chem. Soc., 38 (1916), 609.

Phosphoric Acid.—*Nephelometric Determination.*—Dr. N. Serger reports having accurately determined from 91 to 196 milligrammes of P_2O_5 in 100,000 parts of water. Sample is dissolved in 5 mils of nitric acid and added to 25 mils molybdate solution (see below) and 20 mils of nitric acid. A standard is prepared by mixing 25 mils of molybdate solution with 20 mils of concentrated nitric acid. The two solutions, contained in cylinders, are digested on water-bath at 70° stirring carefully with glass rods (one in each cylinder), avoiding contact with sides of cylinders. The cylinders are placed on black paper and to the standard is now added N/500 phosphoric acid solution until the cloudiness in the two is uniform. Each mil of N/500 solution used is equal to 0.0000372 Gm. P_2O_5. The molybdate solution is prepared by dissolving 600 Gm. ammonium sulphate in 750 mils concentrated nitric acid and 750 mils of water and adding a hot solution of 225 Gm. of ammonium molybdate with water enough to make 3000 mils. Of this 100 to 300 mils were evaporated to dryness in platinum and the residue taken up with 2.5 mils concentrated nitric acid, filtered and washed with enough nitric acid to make 5 mils.—Pharm. Ztg., 61 (1916), 114. (J. H.)

Hypophosphites.—*Therapeutic Value.*—W. McK. Marriott concludes that there is no reliable evidence that hypophosphites exert a physiologic effect; it has not been demonstrated that they influence any pathologic process. They are not foods. If hypophosphites are of any use, that use has never been discovered.—J. Am. Med. Assoc., 66 (1916), 486. (W. A. P.)

Hypophosphites.—*Titration of.*—J. M. Kolthoff has examined the various methods recommended for assaying hypophosphites and arrived at the following conclusions in regard to their accuracy. The methods depend either on the estimation of the amount of oxidizing agent necessary to convert the hypophosphite into phosphate or on the estimation of the oxidation product, *i. e.*, the phosphoric acid. He found that the oxidation method with potassium permanganate in acid solution and titrating back the excess of permanganate iodometrically with potassium iodide and sodium hyposulphite gives reliable results; that, however, the excess of permanganate should not exceed 20 per cent. as otherwise, probably on account of a loss of oxygen during the boiling, too high results are obtained.

The oxidation with permanganate in alkaline solution and titrating back the excess of permanganate after acidulating, iodometrically, instead of titrating with oxalic acid as given by the originators of this method, Marini and Pellegrini, gave too low results. When, however, after the addition of permanganate the mixture was heated to boiling and after acidulating and cooling the permanganate was titrated back, satisfactory results were obtained.

In the potassium chromate method, the oxidation was far from being complete, even when an aqueous solution of the salt was boiled with 100 per cent. excess of the reagent for 20 minutes.

The results obtained by applying arsenic trioxide, silver nitrate, ferric salts or cupric salts for the estimation of hypophosphites were also completely unsatisfactory.

In the method of oxidation with iodine, it was found that hypophosphites are very slowly oxidized by an alkaline iodine solution, more rapidly in the presence of an acid. The author found that by Rupp and Fink's method in which the hypophosphite is first oxidized by iodine in the presence of an acid to phosphite and then after the addition of sodium bicarbonate to phosphate and the excess of iodine is titrated back good results are obtained.

Oxidation with bromine. Bromine oxidizes rapidly in acid solution, Rupp and Kroll's method, depending on this oxidation with bromine, and the results obtained with it are satisfactory. At boiling temperature the reaction is a quantitative one (even when no acid is added) according to the equation:

$$NaH_2PO_2 + 4Br + 2H_2O = NaH_2PO_4 + 4HBr$$

This method also permits estimating the phosphoric acid and hydrobromic acid obtained in the reaction. The latter is determined

by titrating the liquid with caustic potash solution in the presence of methyl orange as indicator and then adding phenolphthalein and continuing the titration thus converting the primary sodium phosphate into the secondary salt. Naturally the excess of bromine should first be removed from the solution by boiling.

As a last method the oxidation with hydrogen peroxide solution was tried but the results obtained with this process were not at all satisfactory. Likewise unsatisfactory were the results of experiments in which potassium percarbonate and potassium persulphate were applied under various conditions.

The authors believe that the most convenient method is the oxidation with Koppeschaar solution and titrating back the excess of bromine iodometrically.—Pharm. Weekblad, 1916, 909.

BORON.

Boron.—*Influence on Plant Growth.*—P. C. Cook found that the form in which boron is present in soil makes but little difference to the amount absorbed by plants growing therein. When borax or colemanite was used in cultural experiments, the results were very similar. Lime, in addition to borax, had no effect in preventing the absorption of boron. Wheat and oats absorbed very little boron; leguminous and succulent plants took up considerable quantities. As a rule, more boron is found in the growing tops of the plants than in the roots. Tomatoes grown in soil containing borax showed only traces of boron in the fruits; lettuces absorbed it in proportion to the amount present in the soil. Potatoes, however, showed but little boron in the haulm, and a considerable quantity in the tubers. Radishes contained much more in the tops than in the roots. Leguminous plants gave a more even distribution of boron than other crops; they are also more sensitive to its influence. The yield of a plot of wheat heavily treated with borax was 90 per cent. that of a manured control, and greater than that of an unmanured control. The yield of tomatoes in pots was unaffected by borax. It is estimated that not more than 0.62 lb. of borax or 0.75 lb. of calcined colemanite should be added to 10 cubic feet of farmyard manure. When using this manure for leguminous crops, it should be mixed with untreated manure before being applied to the soil. In view of the widely recommended use of borax and colemanite as a means of destroying fly larvæ in manure heaps these results assume considerable practical importance.—J. Agr. Research; through Pharm. J., 97 (1916), 161.

Boric Acid.—*Poisoning by.*—P. Willson reports a case where three fluidounces of saturated aqueous solution of boric acid were given to an infant, eight weeks old, by mistake. As it then vomited after nursing, a second dose of three fluidounces was again given, before the error was perceived. Severe gastroenteritis followed, a military eruption appeared on the body, and the patient rapidly lost weight. Desquamation followed and lasted for about ten days, when rapid recovery occurred.—Wash. Med. Ann.; through Pharm. J., 66 (1916), 423.

CARBON AND SILICON.

Colloidal Carbon.—S. Tarczynski reports that when the electric arc passes between carbon electrodes immersed in various organic liquids, such as carbon tetrachloride, chloroform or benzene, contained in an ice-cooled flask, both precipitated and colloidal carbon are formed. After filtration the latter gave an olive-green or reddish brown solution, which was extremely stable, showing the Tyndall effect, and gave, upon heating, a black amorphous precipitate of carbon. That the carbon was actually produced from the organic compounds was shown by the fact that an experiment with platinum electrodes gave the same result. In addition to these products, chlorine, tetrachloroethylene, hexachloroethane and hexachlorobenzene were formed in the decomposition of carbon tetrachloride, and all these substances, together with hydrogen chloride and tetra- and pentachloroethane, from chloroform. The final products of the decomposition are carbon, chlorine, and hexachlorobenzene, which are always formed in the largest amount; the others are all intermediate products.—Z. Elektrochem.; through C. U. C. P. Al. J., 23 (1916), 233. (G. C. D.)

Diamonds.—*Some Reactions.*—L. Colomba, repeating an experiment made by Moissan in 1893, placed some weighed pieces of colorless diamond in a platinum crucible containing pure potassium sodium carbonate. This was sealed and packed in powdered carbon in another crucible which was also sealed. After heating to the melting point of the potassium sodium carbonate for some hours the pieces of diamond were found to be unaltered. Thus, the temperature at the melting point of the salt alone is not sufficient to effect Moissan's reaction. Under the conditions in which Moissan's original experiment was performed, in fused potassium sodium carbonate, the concentration of the carbon dioxide would

be at the maximum and continuous. Doelter found that at 1200° C. the diamond loses weight in carbon dioxide. At this temperature the amount of dissociation of the gas into carbon monoxide and oxygen is 0.04 per cent. The author, therefore, considers that the conclusions of Jacquelin, Doelter, Baumheinaer and others are correct, and that the oxidation of carbon is due to the reduction of the carbon dioxide, and that the diamond reacts then in a similar manner to other forms of carbon. Since Moissan has proved that colorless diamond is not attacked by fused potassium chlorate or nitrate, it seems that the atomic state of the oxygen is not insignificant.—Atti accad. Lincei; through Pharm. J., 97 (1916) 85.

Silicium Hydrides.—*Isolation and Properties.*—In an extensive article Alfred Stock and C. Somieski report concerning the silicium hydrides obtained by the action of acids on magnesium silicide. By treating magnesium silicide with hydrochloric acid, care being taken to avoid impurities as much as possible, they obtained a "crude gas" composed of hydrogen and silicium hydrides. From the mixture, the silicium hydrides were separated by use of liquid air, and obtained in pure fractions by distillation *in vacuo* with constant control by means of tension measurements.

As found by closer investigation, the action of acid on magnesium silicide produces monosilan, SiH_4, disilan, Si_2H_6, trisilan, Si_3H_8, tetrasilan, Si_4H_{10}, and probably also pentasilan, Si_5H_{12}, and hexasilan, Si_6H_{14}. The first four were isolated in pure form.

Si_2H_6 is a colorless gas inflammable in air, Si_3H_8 and Si_4H_{10} are mobile, colorless liquids immediately inflaming in air.—Ber.; through Apoth. Ztg., 31 (1916), 33. (J. H. W.)

Colloidal Silica.—*Occurrence in Sponges.*—Microscopists are familiar with the many beautiful forms assumed by the hard siliceous spicules of sponges which play an important part in the classification of those organisms. At the meeting of the Royal Society, Professor A. Dendy described an entirely new type of spicule, which consists of gelatinous material, contracting on the addition of alcohol, and swelling up again on contact with water. This substance appears to be colloidal silica, containing a higher percentage of water than the hydrated silica, or opal, of which ordinary sponge spicules are composed. The name collosclere has been given to these spicules. They lie in vesicles in the mesoglœa, but these vesicles do not represent the mother cells or scleroblasts by which they are secreted. Collosclères are extra-cellular products. They first appear as

knobs on the outer surface of the cell membrane of large, spherical scleroblasts. They were discovered in a member of a new genus of sand sponges from Australia, which has been named Collosclerophora arenacea.—Pharm. J., 97 (1916), 55.

METALS

ALKALIES.

Potassium.—*American Sources.*—Owing to the scarcity of potassium salts of the Stassfurt mines during the war, Frank K. Cameron calls attention to the following American sources:

Desert Basins, as Searle's Lake, San Bernardino County, California, contains from 5 to 6 per cent. KCl. It is owned by the Trona Comp. of California.

Alunite, an insoluble mineral, basic potassium aluminum sulphate, is found in immense deposits near Marysvale, Piute County, Utah. The Mineral Products Co. and the Utah Potash Co. are now working these deposits and manufacture K_2SO_4.

Kelp on the Pacific coast of North and South America is another profitable source. Macrocystis pyrifera, a perennial alga, is the most important, as it has the property of absorbing exceptionally large quantities of potassium from the sea water. Large kelp beds from a few acres to 15 square miles are located south of Point Sur, on the California coast, and north of the Cedros Islands, off the coast of Mexico. The Marcocystis plant, when freshly harvested, contains from 3 to 5 per cent. KCl. The kelp ash contains very little soluble material other than KCl and NaCl. The oft-heralded promise of cheap iodine is purely illusory, as its only commercial source to-day is the mother liquor of Chili saltpeter. Only about $^1/_{12}$ of the possible yield of iodine from this source is recovered in peace time, simply because this satisfies the demand.—Sc. Am. Suppl. No. 2089, Jan. 15, 1916. (O. R.)

Potassium Carbonate.—*Contamination with Chlorate.*—Kohen reports on a sample of potassium carbonate which gave only a slight reaction for chlorides when its aqueous solution was treated with nitric acid and silver nitrate, which, however, yielded a strong turbidity after it had been heated at red heat. The presence of chlorate is probably due to the potassium chloride solution having contained, as it generally does, small amounts of chlorates, which, being very resistant, were not decomposed in the electrolytic process. Potassium carbonate therefore should always be tested

for chlorate with potassium iodide starch paste.—Chem. Ztg.; through Drug. Circ., 60 (1916), 213.

Potassium Chlorate.—*Unusual Explosion of.*—F. E. Rowland states that an 8-inch pestle and its mortar were thoroughly cleaned and about fifteen pounds of potassium chlorate was powdered therein without mishap. The pestle and mortar were washed and dried. A few days later, some pumice-stone was crushed in the same, when a violent explosion occurred. The mortar was shattered; one piece being blown through an adjacent window. The wooden handle was split to pieces. This enabled the cause of the explosion to be traced. At the end of the handle, which fitted into the socket of the pestle, quite a large quantity of sulphur was found. Doubtless a small amount of potassium chlorate had worked into the crevice of the joint and come in contact with the sulphur. The jarring caused by crushing the pumice had doubtless occasioned this to detonate. An examination of other pestles of the same type showed them to contain as much as 20 grammes of sulphur. The explosion might have been disastrous, had it not occurred with the inert pumice. In a few days, the same pestle and mortar would have been again used to powder several pounds of chlorate. The pestle was of European make and had its wooden handle cemented to the wedgewood head by use of molten sulphur. —J. Ind. Eng. Chem., 8 (1916), 517.

Sodium Bicarbonate.—*Incompatible with Bismuth Salicylate.*—A prescription calling for 3 grammes of bismuth salicylate, 3 grammes of benzonaphthol, 2.5 grammes of sodium bicarbonate and "potion gommeuse" of the French Codex enough to make 300 mils, was mixed without trouble, but, after being bottled and allowed to stand for a few minutes, the cork was blown out and a violent effervescence occurred. Astruc and Cambe, on study of the problem, found that the incompatibility existed between the salicylate and the bicarbonate, the reaction being: $Bi(OH)_2C_7H_5O_3 + NaHCO_3 = BiO(OH) + NaC_7H_5O_3 + CO_2 + H_2O$. The effervescence occurs when any salicylate or benzoate of a heavy metal is treated with sodium bicarbonate. It does not occur when sodium carbonate is substituted for the bicarbonate.—J. pharm. chim., 14 (1916), 353.

Sodium Chloride.—*Contamination of.*—C. Lohman finds it a difficult matter to obtain common salt that is entirely free from potassium chloride as even the article labelled "C. P." is not always

as pure as the label would indicate. Specimens prepared by various accepted methods have invariably shown that potassium chloride was present in quantities varying from 0.27 to 0.48 per cent., while specimens supposed to be chemically pure were found to contain the potassium impurity to the extent of 0.45 to 0.57 per cent. In all the specimens examined, the presence of potassium could be distinctly seen with the flame test, using a piece of blue glass.—Chem. News, 114 (1916), 53.

Sodium Nitrate.—*Use in Gaseous Gangrene.*—E. S. Harde reports that the administration of sodium nitrate by the mouth and the local application of its solution have given good results in the treatment of the first stages of gaseous gangrene where B. perfringens, usually associated with other bacteria, was the active agent. Evolution of gas was quickly checked when this treatment was carried out, and the general condition markedly ameliorated. Probably the diuretic action of the nitrate, when given internally, played an important part in the extremely rapid disintoxication which was obtained. It is possible that other diuretics might have a similar action.—Compt. rend. soc. biol.; through Pharm. J., 96 (1916), 471.

Sodium Nitrate.—*The Industry in South America.*—At the Pan-American Scientific Congress, E. Cuevas described the Chilean nitre beds, which were discovered in the seventeenth century, first worked in 1812, and worked upon a practical basis in 1855. The writer claims that less than 3 per cent. of the total bed has been surveyed and prospected and that in the surveyed portion there is enough nitrate to supply the world for 100 years to come. He feels that there is no chance of atmospheric nitrate competing seriously with the Chilean product. He described method of extraction and gave data as to the consumption of nitrate as a fertilizer.—Am. J. Pharm., 88 (1916), 189.

Sodium Nitrate.—*Explosion with Bromides.*—Luff and Finnemore find that sodium nitrite and ammonium bromide react with explosive violence, the reaction being as follows:

$$NaNO_2 + NH_4Br = NaBr + NH_4NO_2$$
$$NH_4NO_2 = N_2 + 2H_2O$$

A similar reaction occurs between the nitrite and potassium and sodium bromides, but it is less violent.—Merck's Rep.; through Drug. Circ., 60 (1916), 21.

Sodium Perborate.—*Quality of Commercial.*—A. Berthelot finds that much of the sodium perborate on the market, while suitable for technical purposes (such as bleaching), is not sufficiently pure for pharmaceutical employment or for preparing tooth powders. It frequently contains sufficient sodium carbonate to render it irritant to the mucous membrane. Since there is at present no official recognition of this salt in the French Codex, it should be specified to be free from heavy metals, from carbonates, and to evolve 8 per cent. of available oxygen when purchased for medicinal use.—J. Med. Chirurg.; through Pharm. J., 97 (1916), 277.

Acid Sodium Phosphate.—The best drug to render alkaline urine acid is the acid sodium phosphate, says Dr. W. J. Robinson. But bear in mind that there are two sodium phosphates: The official one, which is an alkaline phosphate and has the formula Na_2HPO_4 (*di*-sodium hydrogen phosphate), and the true acid phosphate, which has the formula NaH_2PO_4 (mono-sodium di-hydrogen phosphate). To be sure to get the right one, prescribe: Sodium hydrogen phosphate, monobasic, or Sodium dihydrogen phosphate, *non-official.* You may order two or four ounces, ordering half to one teaspoonful in a glass of water three or four times a day. When given in conjunction with hexamethylenamine, it increases the efficiency of the latter. For, as is well known, hexamethylenamine preparations act best in an acid medium. If the urine is alkaline the action of hexamethylenamine is practically nil.—Critic and Guide; through Am. Drug., 64 (1916), 95.

Sodium Sulphate.—*Detection of Arsenic in.*—P. Carles states that there are two distinct varieties of Glauber's salt met with in French pharmacy. One gives a clear solution in distilled water; the other a more or less turbid solution. The first is the only kind that should be used for dispensing or for human medicine; the second is reserved for veterinary use. This impure form is made on the Continent by decomposing sea salt with sulphuric acid. The latter is almost always invariably distinctly arsenical, so that the resulting sodium sulphate is generally more or less heavily contaminated with arsenic. The official test for this impurity, involving the use of Marsh's apparatus, is not always convenient for use in the pharmacy. Bougault's test with zinc

and caustic alkali, although simple and easily applied, is not reliable in the case under notice, since the arsenic is present in the impure Glauber's salt in an arsenic state, probably as ferric arsenate. The author finds that it may readily be liberated by employing dilute sulphuric acid instead of alkali as a source of hydrogen from zinc. About 5 Gm. of pure sulphuric acid are mixed in a small flask with 100 mils of water; 5 Gm. of pure zinc are introduced. The gas evolved is brought in contact with mercuric chloride test-paper in the usual manner. If the zinc and acid are arsenic-free, no stain should be obtained in forty-five minutes. Fifty grammes of the sodium sulphate are then added to the liquid in the flask, and the gas evolved is tested, as before, with a fresh piece of sublimate paper. It is claimed that this simple method will easily detect 0.00001 Gm. of arsenic in 100 Gm. of sodium sulphate.—Rep. pharm.; through Pharm. J., 96 (1916), 577.

Sodium Sulphite.—*Quality of.*—Investigation has shown that while the crystallized sodium sulphite is unreliable, the dried or desiccated form of sodium sulphite is generally of good quality and relatively permanent. A. H. Clark reports experiments showing that specimens of desiccated sodium sulphite keep for years with little deterioration.—Drug. Circ., 60 (1916), 396. (W. A. P.)

Vichy Salts.—*New Analysis of.*—A. Mallat publishes his analysis of the genuine Vichy salt obtained by him at the spring in December, 1915. The analysis is remarkable for the extreme care bestowed upon the work. The lengthy figures should be consulted in the original article.—J. pharm. chim., 14 (1916), 323.

CALCIUM, STRONTIUM AND BARIUM.

Calcium Compounds.—*Criticism of the Test of U. S. P. IX.*—Carl E. Smith calls attention to a deficiency in the test of the eighth revision of the United States Pharmacopœia for the identification of calcium compounds and for the detection of certain possible contaminations such as might easily lead to serious results because of a false sense of security the official tests would give. The test upon which the Pharmacopœia relies entirely in the identification of calcium is the production of a precipitate on addition to the neutral solution of a solution of ammonium oxalate, said precipitate to be soluble in hydrochloric acid and insoluble in acetic acid. This reaction is by no means characteristic of calcium

alone; it is shared by strontium and to some extent by barium, and neither of these latter is excluded or detected by any other test provided. A test for the identification of a substance should be characteristic enough to distinguish it from anything else beyond all reasonable doubt. The remedy suggested is that, in addition to the calcium test named above, a saturated water solution of calcium sulphate be employed for detecting the presence of either barium or strontium. This would make sure that neither of the latter elements is present.—Am. J. Pharm., 88 (1916), 215. (R. P. F.)

Calcium, Strontium, Barium, Zinc and Magnesium Carbonates.—*Some Reactions of.*—W. O. de Coninck has investigated the action of prolonged contact, lasting for a year or more, of saturated aqueous solutions of potassium neutral sulphate and acid bisulphate, ammonium chloride, potassium nitrate, and ammonium nitrate in the carbonates of the alkaline earths and of zinc, at the ordinary temperature. With calcium carbonate and the neutral and acid sulphates of potassium a considerable degree of double decomposition was found to have occurred, notable quantities of calcium going into solution, and equivalent amounts of normal or acid carbonates of the alkali were formed in the respective mixtures. A similar reaction took place between potassium nitrate and calcium carbonate; also between ammonium nitrate and strontium carbonate, between potassium nitrate or ammonium chloride and barium carbonate. Between potassium hydrogen sulphate and strontium carbonate, and also between the same and barium carbonate, there was no reaction. There is a very marked reaction between zinc carbonate and potassium hydrogen sulphate, zinc being found in the solution in a relatively short time. Magnesium carbonate is quickly attacked by ammonium chloride, magnesium being found in solution in fifty-two hours.—Ann. chim. anal.; through Pharm. J., 97 (1916), 135.

Calcium Chloride.—*Use in Hay-Fever.*—Harold Wilson believes that: (1) Some hay-fever patients taking not less than 3 Gm. of calcium chloride daily, even for a short time, are practically relieved from all hay-fever symptoms; (2) calcium chloride may be taken in doses of 3 Gm. daily for an indefinite time without any apparent injury; (3) it is not indispensable in all cases for a hay-fever patent to take calcium chloride over a long period of time in order to secure relief; (4) calcium salts may be given, even when

the nature of the patient's sensitization is not known; (5) the clinical results from the administration of calcium chloride in cases of hay-fever are such as to warrant its further trial.—J. Am. Med. Assoc., 66 (1916), 715. (W. A. P.)

Twenty-six cases were treated by H. Wilson with pollen solutions and twenty-two with calcium chloride. He says that the desensitization of hay-fever patients by means of specific pollen solutions will materially relieve a small percentage of them if treatment is begun early enough. Pollen solutions for therapeutic use should be prepared and used with very great care and understanding. Multiple sensitization is a frequent phenomenon in hay-fever subjects, and its existence may account for many failures in the treatment by means of pollen solutions. The treatment of hay-fever by means of calcium salts rests largely on empirical observations, but a large percentage of patients receive benefit.—Laryngoscope; through J. Am. Med. Assoc., 67 (1916), 318. (W. A. P.)

Calcium Chloride.—*Preparation of Non-Hygroscopic, Water-Soluble Compound.*—According to D. R. P. 288,966 of E. Ritsert, if equivalent amounts of crystallized calcium chloride and anhydrous milk sugar are melted together there results a yellowish-white mass permanent in the air, which when rubbed with 10 per cent. of water forms a stable white powder.

If molten crystallized calcium chloride, to which has been added 10 to 40 per cent. water, be mixed on a water bath at 70° C. with an equivalent amount of powdered anhydrous milk sugar there results a pasty mass which suddenly, with decided evolution of heat, solidifies to a hard, white, plaster-like mass.

On cooling or evaporating concentrated aqueous solutions of milk sugar and calcium chloride air-permanent, water-soluble crystals of calcium chloride-lactose are formed.—Chem. Ztg.; through Apoth. Ztg., 31 (1916), 34. (J. H. W.)

Plaster of Paris.—*Use in Bandaging.*—In using plaster of Paris for bandages, Astruc and Juillet suggest that 60 grammes of water, added to 100 grammes of plaster of good quality, are ample to obtain best results. They claim that the presence of althæa, acacia, tragacanth, salep or linseed will retard the hardening process. The presence of alum or sodium chloride will hasten the hardening process. The rise in temperature observed during the process of hardening is in direct proportion to the purity and dehydration of the plaster of Paris. The presence of powdered althæa not only lessens the intensity of the reaction, but also retards it,

while on the other hand the presence of powdered alum or sodium chloride acts in the opposite direction. The authors claim to have noted instances where the rise in temperature was sufficiently great to produce discomfort to the patient.—C. U. C. P. Al. J., 23 (1916), 35. (G. C. D.)

Plaster of Paris.—*Use of Alcohol to Retard Setting.*—Astruc and Canals find that alcohol added to the water employed for slaking the plaster has a very marked effect in retarding the time of setting and in lessening the degree of heat evolved in the reaction. This effect is directly proportional to the quantity of alcohol added. In round numbers, the addition of 10 per cent. of alcohol doubles the period of time required for the setting of plaster for surgical purposes. Thus, 10 Gm. of plaster of Paris slaked with 60 mils of water took fourteen minutes to set; with the addition of 10 per cent. of alcohol, thirty minutes were required, and with 25 per cent., an hour. Since alcohol is always at hand in the pharmacy, it is more convenient to use than those other ingredients which were previously suggested for the purpose, such as marshmallow powder, tragacanth, gum acacia, or linseed mucilage. By means of this mixture of alcohol and water a surgical plaster can be prepared to set at almost any desired time. The results of a number of experiments with different proportions of alcohol and water are given in tabular form, showing the influence of the alcohol on the time of setting and the elevation of temperature.—J. pharm. chim.; through Pharm. J., 96 (1916), 471.

Phosphorescent Calcium Sulphide.—*Preparation.*—A modification of Verneuil's method of preparing phosphorescent calcium sulphide is proposed by M. Pierre Breteau. This consists in preparing the sulphide from a mixture of calcium carbonate and sulphur by ignition at a red heat and then impregnating it with 1 to 10,000 of its weight of bismuth. This is again raised to a red heat and allowed to cool slowly.—Chem. and Drug., 88 (1916), 37. (K. S. B.)

Strontium Salicylate.—The salicylate of strontium has had a therapeutic reputation for which there is no satisfactory foundation discoverable. It has enjoyed a vogue that is largely due to the propaganda of manufacturers rather than to the writings of any experimenters or carefully observing clinicians. The literature on strontium is quite meagre and not at all convincing. M. A. Blankenhorn concludes from his research that: (1) The mean

toxic dose of strontium salicylate is the same as that for sodium salicylate; (2) strontium salicylate produces the same gastric and other toxic symptoms produced by any salicylate; (3) it is no more effectual in relief of pain; (4) it is not so convenient to give as are the more soluble salicylates.—J. Am. Med. Assoc., 66 (1916), 331. (W. A. P.)

Barium Platinocyanide.— *Varieties.*—The different kinds of barium platinocyanide, which include two crystalline and an amorphous variety, all having the formula $BaPt(CN)_4.4H_2O$, are described by Leonard A. Levy. The two crystalline salts, identical in form, are orange and apple-green, the latter being brilliantly fluorescent. The amorphous salt is brick-red and non-fluorescent. The difference in the two crystalline forms is due to sterioisomerism. The two forms of zinc sulphide are also referred to, one of which displays fluorescence and phosphorescence, and in admixture with radium salts is used to make luminous dials for watches and scientific instruments. This form also exhibits triboluminescence—that is, gives out luminous flashes when gently rubbed in a glass mortar with a pestle. The fact that intensifying screens for X-ray work are made from calcium tungstate is also given.—Chem. and Drug., 88 (1916), 819. (K. S. B.)

RADIUM AND RADIO-ACTIVITY.

Radium.—*Extraction from Carnotite.*—Parsons, Moore, Lind and Schaefer publish an illustrated paper describing the extraction of radium salts as carried out in the Colorado plant of the Bureau of Mines. The extraction found most satisfactory is (*a*) treatment of the ore with hot concentrated nitric acid; (*b*) separation of the radium-barium sulphate thus dissolved by precipitation with the proper amount of sodium hydroxide; (*c*) conversion of the precipitated sulphates into sulphides, by reduction with carbon; (*d*) dissolving of the sulphides in strong hydrochloric acid; (*e*) fractional crystallization of the radium chloride from the barium chloride.

Radium is present in carnotite in proportion of about 1 part to 200,000,000 and the yield by the process just outlined is from 70 to 90 per cent. The cost of production of radium (expressed as element) is calculated at $37,599 per gramme.

As side products, uranium and vanadium oxides are recovered from the ore, and the returns from the sale of these will ultimately lower the price of radium by several thousand dollars per gramme.—J. Ind. Eng. Chem., 8 (1916), 48.

Radium.—*Production in Bohemia.*—In the mining of uranium ore in Bohemia, 25,720 pounds of uranite were prepared by smelting in 1915, with an average value of $471.50 per 100 lbs. The government factory produced radium compounds containing 1.754 Gm. Ra, having a total value of $209,364.50, an increase of 0.879 Gm. with a value of $100,000 over the 1914 production.—Sc. Am. Suppl., 23 (1916), 280. (O. R.)

Radium.—*Therapeusis of.*—J. Macdonald Brown discusses the important facts about radium. He tells of its source, its rarity, the difficulty of isolating it, its physical, chemical and biological properties. He describes the three kinds of rays and gives the properties of the emanation. He describes the apparatus used in treating diseased conditions with radium and gives the four methods of administration as well as a long list of ailments where beneficial results may be obtained. He defines some terms indicative of the strength of radium water. He considers somewhat in detail the value of some natural waters that possess radio-activity. Finally he gives a diagram from Professor Soddy's work showing the complete disintegration series beginning with uranium, extending through ionium, radium, and its emanation, and seven intermediate radiums.—Pharm. J., 96 (1916), 217. (Z. M. C.)

Radium Paint.—*Durability.*—The light given out by radium paints is practically monochromatic, says Harrison Glew, although there might be a very faint violet line. The paint is not permanent, as the zinc sulphide becomes exhausted. The radium is there, however, and can be recovered.—Chem. and Drug., 88 (1916), 40. (K. S. B.)

Radium.—*In Water from the Gulf of Mexico.*—Prof. Stewart J. Lloyd has published the results of an examination for radium of a sample of water from the Gulf of Mexico, about 200 miles south of Mobile. He also gives a résumé of the results obtained by other investigators in measuring the radium content of sea water. The ocean is the greatest reservoir of radium, containing about 1400 tons of that element.—Sc. Am., Sept. 18, 1916, 245. (O. R.)

Radium.—*In the Waters of the Atlantic and Pacific Oceans.*—U. Mialock has investigated the radio-active value of the salts contained in the waters of the Atlantic and Pacific between Montevideo and Callao, and finds that radium is present therein in estimable quantities. These waters, from a number of geographical sources, were evaporated, the amount of total residue determined; then this was dissolved in distilled water. The solutions were allowed to stand in sealed flasks for six months, the emanations emitted during the period serving as the basis for determining the radio-activity. The mean value of all the observations gave 147.7×10^{-14} Gm. of radium in each Gm. of oceanic salt, or 1877.8×10^{-17} Gm. per mil of water. The distribution of radium in sea water was found to be not at all uniform. Water collected in the ports of Corral, Coronel, Valparaiso, and Antofagasta contained more radium than that from other sources. The amount varies greatly with the geographical source.—Ann. Soc. Scientif. Argentin; through Pharm. J., 97 (1916), 297.

Radium.—*In Spring Water.*—Weekly measurements made by R. R. Ramsey, during nine months, show that the radio-activity of two springs in Indiana increases and decreases as the flow of water is greater or less; in this locality, the flow of all springs varies with the rainfall. These facts, and also the fact that the highest values for radium emanation were obtained from "wet weather" springs a short time after very heavy rainfall, point to the conclusion that the surface water, in percolating through the soil, dissolves and carries down with it some of the emanation which is continuously moving upwards from the earth's center to the surface. During dry weather, when the flow is not rapid, a large amount of this dissolved emanation is transformed into its products and lost, before the water issues from the ground.—Phys. Review; through Pharm. J., 97 (1916), 237.

Radium.—*In Norwegian Spring Waters.*—Poulsson reports that he has examined the waters from a hundred Norwegian springs. Almost all these proved to be radio-active, but in most cases the activity was very slight. The most active waters were those from Naesodden, Sandsvaer, at Jellum, near Modum, and on the Tandberg Estate in the Simoa Valley. The respective activity of these four springs was equivalent to 43.75, 31.6, 76.1, and 164.5 Maché units.—Videnskap. Math. nat.; through Drug. Circ., 60 (1916), 147.

Thorium.—Thurston Owens gives an interesting account in the "Chemical Engineer." Three hundred million gas mantles, consumed annually throughout the world (80 million in the United States) are dependent upon the supply of thorium. Its chief source is monazite sand, which is mined successfully in North and South America. By a very complicated chemical process, thorium nitrate is manufactured from monazite, and about 60 to 70 per cent. of residue is obtained consisting of the cerium group of rare earths. The property of emitting light radiations as the visible part of the spectrum has been known and applied for over a century, but it was Dr. Auer von Welsbach who, in 1886, discovered that thorium had the unusual qualities of holding together and thus introduced the mantle mesh. In 1891 he improved this by the addition of 1 per cent. of cerium, and thus produced the highest efficiency and also the nearest approach to white light.—Sc. Am. Suppl. No. 2107, May 20, 1916. (O. R.)

Thorium.—*Extraction of Radio-Active Bodies from.*—An anonymous author discusses the sulphuric acid and ammonia process for extracting thorium X from monazite and similar substances and claims that the lead sulphate formed in the former prevents solution of the thorium X by adsorbing the latter. Lead sulphide and lead chloride do not possess this property of adsorption. The author recommends digesting the precipitated radio-active lead sulphate with sodium hydroxide solution followed by washing with dilute NaOH solution and water. The residue is dissolved in hydrochloric acid and the lead is precipitated with hydrogen sulphide. The filtrate from the latter will hold the thorium X in solution. The lead sulphate is prepared by treating a solution of thorium salts, to which some sulphuric acid has been added, with a small quantity of lead acetate. After some time the supernatant fluid is siphoned off and the precipitate is washed first with diluted sulphuric acid and then with water.—Pharm. Zeit., 61 (1916), 254. (J. H.)

Uranium.—*Atomic Weight.*—Using pure crystallized uranium ore found in Morogoro, East Africa, instead of that obtained from impure pitchblende, O. Hönigschmid and St. Horovitz find the atomic weight to be 238,159 + 0.023, corresponding to the value obtained when using uranium from Joachimsthal pitchblende.—Chem. and Drug., 88 (1916), 471. (K. S. B.)

Copper.—*Brittleness.*—W. E. Ruder at the 29th meeting of the American Electrochemical Society, showed that the brittleness of annealed copper is due to deoxidation or reduction of the cuprous oxide around the primary copper grains, leaving a spongy mass of but little mechanical strength.—Sc. Am. Suppl., 1916, No. 2108. (O. R.)

Cupric Thiocyanate.—*Reduction Products.*—By permitting the reaction between cupric thiocyanate and water to proceed to the end (10 to 20 days), J. C. Philip and A. Bramley discovered that the following products were formed: Cuprous thiocyanate, hydrocyanic acid, sulphuric acid, carbon dioxide, ammonia and urea.—Chem. and Drug., 88 (1916), 165. (K. S. B.)

Silver.—*Crystalline Variety of.*—T. C. Choudhri treated spongy amorphous silver, prepared by igniting pure silver tartrate at the ordinary temperature, with pure nitric acid (sp. gr. 1.42) previously freed from lower oxides of nitrogen by boiling with carbamide. At first, some action took place, silver nitrate and nitrous acid being formed. After a time this stopped; on allowing the mixture to stand, with occasional shaking, for about two weeks, the remaining undissolved amorphous silver passed into the crystalline state, forming long needle-shaped crystals, easily visible to the naked eye. Slender needles were first formed floating on the surface of the acid liquid. This is considered to be a new variety of crystalline silver, belonging to the cubical system.—Chem. News, 113 (1916), 245.

Silver.—*Determination of Small Amounts by Cyanometry.*—G. Rebière writes that it is possible to render more delicate Denigès' method for the cyanometric determination of silver if N/100 silver nitrate solutions are employed and use is made of the property of colloids of dispersing light (Tyndall's phenomenon) to detect the end-point. As indicator, silver iodide is used which, under the existing conditions, separates out in colloidal form. Into a bottle with parallel sides are placed 100 mils of the silver solution to be titrated and to this are added 10 mils of a mixture of 10 mils N/10 potassium cyanide, 20 mils ammonia water, and 80 mils water; a few drops of 5 per cent. potassium iodide solution are also added. A bundle of parallel light rays is passed through the liquid and titration accomplished in a darkened room with N/100 silver nitrate till appearance of the characteristic bluish opalescence. From the number of mils of N/100 silver nitrate solution, $^1/_{20}$ mil is to

be subtracted as correction for the end-point. The titer of the above-mentioned ammoniacal potassium cyanide solution must first be determined under the same conditions against N/100 silver nitrate.—Bull. soc. chim.; through Apoth. Ztg., 31 (1916), 24. (J. H. W.)

Colloidal Silver Preparations.—*Assay of Potassium in.*—Vanderkleed and E'we assay potassium in such preparations by igniting same, taking up with hot nitric acid, diluting with water, precipitating out the silver with hydrochloric acid, evaporating the filtrate, igniting the residue, taking it up with water, and finally precipitating and weighing the potassium as potassio-platinic chloride, by the usual gravimetric procedure.—J. Am. Pharm. Assoc., 5 (1916), 715.

Colloidal Silver Preparations.—*Assay of Silver in.*—Wastenson suggests the following method: One-half gramme of the preparation is dissolved in a Kjeldahl flask in 10 mils of strong sulphuric acid and 2 mils of concentrated nitric acid and the mixture is heated until all the nitrogen oxides are expelled and white fumes of sulphuric acid begin to be driven off. After cooling, 25 mils of water are added, the mixture is evaporated again, the residue taken up in 100 mils of water and the silver titrated with ammonium sulphocyanide solution.—Pharm. Post; through Pharm. Weekblad, 53 (1916), 1061. (H. E.)

Argyrol.—*Incompatibility with Iodine.*—W. J. Robinson instances a case where the physician prescribed argyrol, potassium iodide, iodine and water for painting the throat. The result was that the throat became intensely inflamed and irritated, and the patient changed doctors. The reason is easy to understand; the argyrol is completely destroyed as argyrol, silver iodide being formed, which in more or less strong solution is extremely irritating, and instead of soothing an inflamed mucous membrane will increase the inflammation.—Critic and Guide; through Drug. Circ., 60 (1916), 337.

GOLD.

Colloidal Gold.—*Coagulation of.*—R. Zsigmondy finds that the coagulation and separation of colloidal gold solutions, containing particles below 0.2 micron in size, when shaken with organic solvents, are due to impurities in the solvents or in the gold solution. Coagulated colloidal gold adheres to droplets of benzene on shak-

ing, and rises with them to the zone of separation. Contact of acid gold solutions with traces of protein, derived from the finger used to close the test-tube, are sufficient to induce this coagulation.—Z. angew. Chem.; through Pharm. J., 97 (1916), 505.

MAGNESIUM.

Magnesium Carbonates.— *Various Forms.*—Fitcher and Osterwalder state that when magnesium sulphate solution is treated with ordinary ammonium carbonate solution, which reacts as a mixture of ammonium carbonate and bicarbonate, crystalline hydrated magnesium carbonate, $MgCO_3$, $3H_2O$ is slowly precipitated. The precipitate forms more quickly if the mixture is warmed. If ammonia is added before adding the ammonium carbonate, so that the proportion of ammonia to carbon dioxide corresponds to the formula $(NH_4)_2CO_3$, crystals of the hydrated magnesium carbonate appear within thirty minutes. If the mixture is heated to 40° C. an amorphous precipitate of basic magnesium carbonate, magnesia alba, is formed, which changes into the hydrated carbonate when the liquid cools. If the ammonium carbonate solution contains an excess of ammonia the same reaction occurs, but the complete conversion into hydrated carbonate is slower, requiring several hours in the cold. But if the precipitation is performed from a hot solution the basic carbonate is permanent, in presence of excess of ammonia, when the liquid cools. A double carbonate, $(NH_4)_2CO_3$, $MgCO_3$, $4H_2O$, may be obtained by treating a cold solution of one equivalent of magnesium sulphate with a cold solution of ten equivalents of ammonium carbonate, $(NH_4)_2CO_3$.—Z. anal. Chem.; through Pharm. J., 97 (1916), 369.

Magnesium Chloride.—*Assay of.*—L. Bourdet determines the quality of magnesium chloride by treating it with nitric acid and converting the resulting nitrate into oxide by calcination. By determining the amount of water-insoluble matter, the weight of total nitrate prior to calcining, and the total chlorine, he is able to calculate the amount of magnesium chloride even when other metals are present.—J. pharm. chim., 13 (1916), 102.

Magnesium Citrate.—*Changes in Composition or Aging.*—E. Leger has submitted the chemical, magnesium citrate, prepared as directed in the French Codex, to solubility tests after one year's aging. He finds that a sample dried at ordinary temperature was

almost completely soluble in a cold saturated solution of tri-magnesium citrate (residue only 0.7 per cent.). On the other hand, a sample of the official citrate dried at 50° C., treated in the same way, left 34.5 per cent. residue. He thinks that the portion soluble in tri-magnesium citrate solution is largely magnesium citrate containing seven molecules of water; that the residue insoluble in tri-magnesium citrate solution is magnesium citrate containing $13H_2O$, since such residues are freely soluble in boiling water. He had the opportunity of treating a sample of the official magnesium citrate that was 16 years old with saturated solution of tri-magnesium citrate and found that only 18.2 per cent. was insoluble.—J. pharm. chim., 13 (1916), 209.

Magnesium Sulphate.—*Arsenic Bearing.*—At a meeting of the Pharmaceutical Society of Paris, L. Grimbert called attention to the presence of arsenic in magnesium sulphate of commerce. Three samples examined by him contained in each kilogramme 0.47, 0.68 and 0.32 gramme of arsenic, respectively. This would mean that each 50 gramme dose of such magnesium sulphate would furnish the patient with the equivalent of 0.097, 0.141 and 0.66 gramme of sodium arsenate, respectively.—J. pharm. chim., 13 (1916), 197.

Magnesium Sulphate.—*Arsenic in.*—E. Fleury commenting on the foregoing paper recommends that the arsenical determination in such cases be made not by the ordinary Marsh procedure, but by the staining of mercuric chloride or silver nitrate paper with the generated arsine.—J. pharm. chim., 13 (1916), 385.

Magnesium Sulphate.—*Anesthesia by Intravenous Injection of.*—Charles H. Peck and Samuel J. Meltzer report briefly the course of anesthesia in three operations on human beings exclusively under the influence of an intravenous injection of magnesium sulphate. The observations prove conclusively the state of anesthesia, *i. e.*, sensation as well as consciousness are temporarily more or less completely abolished. This central effect may or may not be accompanied by a pronounced paralysis of the endings of the motor nerves of a great part of all skeletal muscles. The employment of intravenous injection of magnesium salt as an anesthetic may prove to be indeed a practicable and advantageous method, because, in the first place, it may cause simultaneously a moderate degree of relaxation of the muscular mechanism, and,

secondly, because the untoward effects can be rapidly reversed by a careful administration of a solution of calcium chloride. This method, however, before it can be made practically serviceable, will require a good deal of careful study.—J. Am. Med. Assoc., 67 (1916), 1131. (W. A. P.)

Meerschaum.—The principal source of supply has been, for many years, the deposits in the plains of Eskishehr, in Anatolia, Asia Minor, about 120 miles southeast of Constantinople. These deposits have been briefly described by J. Lawrence Smith in 1849. They are scattered in rounded nodular masses, with pebbles and fragments of magnesian and hornblende rocks. The mineral sepiolite, or meerschaum, as it is commonly called, is a hydrous silicate of magnesia with the probable composition $H_4Mg_2Si_3O_{10}$ or $2H_2O$ plus $2MgO$ plus $3SiO_2$. Pure meerschaum is a white, porous mineral, with a specific gravity of about 2. In much of it, however, the porosity is so great that blocks of the mineral will readily float on water. This property, along with its snow-white color, gives rise to the name, meerschaum, from the German for sea foam. In a similar way the French often call it "ecume de mer." The hardness of meerschaum is from 2 to 2.5. It is very tough, breaking with a conchoidal to earthy fracture. Some forms have a leathery or fibrous texture, and in these the toughness is very pronounced. The luster is dull and earthy, somewhat like that of plaster. The manufacture of meerschaum, together with clay, amber, horn, wood, metals, etc., into pipes and similar articles, is a thriving industry in parts of Germany and Austria. The headquarters of the industry in Germany is at the town of Ruhla, in the Thuringian Forest. The treatment that meerschaum receives before reaching the consumer is varied. As Eskishehr the crude mineral is mined from systematic pits and galleries. The nodular masses are first roughly scraped to remove the earthy matrix; then dried, scraped again, and polished with wax. The roughly polished nodules, in almost every conceivable peculiarity of form, are then shipped to the manufacturers. Pipe bowls are first turned out on lathes or carved by hand. The bowls are then smoothed down with glass, paper and Dutch rushes, and after being boiled in wax, spermaceti, or stearin, are carefully polished with bone ash or chalk. Artificial and imitation meerschaum are also manufactured for the trade. Artificial meerschaum is made by consolidating waste chips and fragments by pressure. Imitation meerschaum is sometimes prepared by treating hardened

plaster of Paris with wax and coloring with gamboge and other suitable materials. Many of these imitations are nearly perfect. Two deposits of meerschaum have been located in Grant County, New Mexico.—Sc. Am. Suppl. No. 2103, 1916. (O. R.)

ZINC, BERYLLIUM AND CADMIUM.

Zinc-Bronze Alloys.—*Strength.*—One of the conclusions arrived at in Technological Paper No. 59 of the Bureau of Standards is that the presence of oxides is one of the most potent sources of weakness of these alloys in their cast condition.—Sc. Am. Suppl. No. 2107, May 20, 1916. (O. R.)

Zinc Oxide.—*Use in Diarrhea.*—Dejust reports that excellent results have been obtained with zinc oxide in the treatment of diarrhea. Its action depends on the fact that zinc salts precipitate mucine.—J. pharm. chim.; through Drug. Circ., 60 (1916), 337.

Beryllium.—*Separation from Aluminum.*—H. D. Minnig in a former paper ("Am. J. Sci.", 1915, 197) described the quantitative separation of aluminum from iron by the use of acetyl chloride in acetone. The same method has been found admirably adapted to the separation of aluminum from beryllium.

The method of procedure is as follows: The solution of the two chlorides is evaporated to the smallest possible volume on the steam-bath. Should the vaporation proceed to dryness the salts are dissolved with the aid of a drop of hydrochloric acid. The beaker containing the concentrated solution is placed in a dish of cold water and the acetone-acetyl chloride mixture (4:1) added drop by drop from a dropping funnel to the complete precipitation of the hydrous aluminum chloride; 15 to 20 mils usually sufficing. The settling of the crystalline precipitate is a good indication, though not an infallible one, of the complete precipitation of the aluminum chloride. The precipitate is transferred to a weighed perforated platinum crucible and carefully washed with the precipitating mixture. The filtrate and washings are collected in a beaker under a bell jar. The precipitate is dried slowly, at first high above the flame, the heat being gradually raised. The hydrous chloride on ignition leaves the oxide.

The acetone-acetyl chloride solution of beryllium is copiously but cautiously diluted with water, the resulting solution is warmed to remove the acetone. It is then boiled and ammonium hydroxide

added to alkaline reaction. The precipitate is allowed to settle, collected on a filter and treated as usual in determinations where beryllium is weighed as the oxide.

With care the process seems to give excellent results, though there is danger of inclusion of beryllium chloride with the precipitated aluminum compound if the addition of the precipitating mixture is not stopped as soon as the separation of the crystalline aluminium chloride is complete. Its appearance is very unlike that of the aluminum chloride and can easily be distinguished.

The comparative insolubility of beryllium chloride in acetone-acetyl chloride (4:1) limits this process therefore to the separation of quantities of the two elements present as the chlorides which do not exceed the equivalent of 0.15 Gm. of the oxides. Of this amount beryllium oxide should not greatly exceed one-third.—Am. J. Sci.; through Chem. News, 113 (1916), 93. (J. A. K.)

Cadmium.—*Atomic Weight.*—Oechsner de Coninck and Gérard purified the metallic cadmium used by dissolving in sulphuric acid and precipitating the solution with hydrogen sulphide, thus separating the cadmium with copper and some zinc. The precipitate was then dissolved in concentrated hydrochloric acid, the excess acid evaporated off and the residue treated with a great excess of ammonium carbonate, thus precipitating only the cadmium as carbonate. This purification was repeated three times. Finally a weighed amount of the pure cadmium carbonate was reduced to metal by means of hydrogen. As average of five such determinations, the value 112.32 was obtained.—Compt. rend.; through Apoth. Ztg., 31 (1916), 83. (J. H. W.)

Cadmium.—*Atomic Weight.*—Baxter, Grose and Hartmann determined the atomic weight of cadmium, by the use of a specially devised electrolytic cell having a mercury cathode; the results obtained with $CaBr_2$ and $CaCl_2$ agree very closely with those previously obtained by the comparison of the chloride and bromide of cadmium with silver. They assign the figure 112.415 as the atomic weight of cadmium, whereas their contemporaries, Hulett and co-workers, give the figure 112.407. Methods and tables are given.—J. Am. Chem. Soc., 38 (1916), 857. (B. J. D.)

Cadmium.—*Detection.*—R. Salvadori states that a 20 per cent. solution of ammonium perchlorate in solution of ammonia of sp. gr. 0.90 is a sensitive reagent for cadmium, which it precipitates as a white crystalline double perchlorate of the formula $Cd(ClO_4)_2$.-

$4NH_3$. In applying the test to the mixed sulphides of copper, cadmium and bismuth, as precipitated in the second group, the precipitate is dissolved in nitric acid, and the solution treated with excess of ammonia. The bismuth hydroxide is filtered off, and the blue filtrate treated with the reagent, which precipitates the cadmium even when five times its amount of copper is present.—Ann. chim. applic.; through Pharm. J., 96 (1916), 555.

MERCURY.

Pulvis Fluens Hydrargyri.—*Mixtures of.*—M. N. Reimers gives formulas for mixtures of pulvis fluens hydrargyri (See Year Book, 1915, 210).

Pulvis Fluens Hydrargyri 30%.

Hydrargyri	30 Gm.
Lycopodii	15 Gm.
Ol. Terebinth. rect	q. s. (about 5 Gm.)
Amyl. Tritici pulv	55 Gm.

Pulvis Fluens Hydrargyri Lanolinatus 30%.

Hydrargyri	30 Gm.
Lycopodii	15 Gm.
Ol. Terebinth. rect	q. s. (about 5 Gm.)
Pulv. inspersor. lanolin	55 Gm.

The last item is composed of:

Amyl. Tritici pulv	45 Gm.
Talc. pulv	50 Gm.
Lanolin	..
Petrolatum	ana 2.5 Gm.

The mixture is readily prepared by mixing the mercury with the lycopodium with addition of some turpentine oil and rubbing till the mercury is finely divided; the starch or fat powder is then incorporated and the powder exposed to the air till the oil of turpentine has largely vaporized.

The above changes in Unna's Pulvis Fluens Hydrargyri prevent, especially in the second formula, the dispersing of the light powder on application. The preparations keep very well. A powder containing 80–90% mercury can also be prepared and is serviceable for the preparation of mercury ointment and plaster, the small content of lycopodium being of no consequence.—Arch. Pharm. Chem.; through Apoth. Ztg., 31 (1916), 417. (J. H. W.)

Mercury Hydrosols.—C. Amberger reports as follows: Therapeutically active and stable colloidal mercury can be obtained by the use of albumins or their products of decomposition as protective agents. Solid hydrosols containing up to 80 per cent. of mercury have been prepared by the addition of a solution of mercuric chloride to mixtures of glutin or dextrin with pyrogallol, catechol, or certain aminophenols, whereby a yellowish white precipitate is obtained. On the addition of alkali reduction takes place, and colloidal mercury is obtained. If glutin or dextrin is mixed with a solution of an alkali and a mercuric salt added, colloidal mercuric oxide is obtained. By the reaction between colloidal mercury and colloidal mercuric oxide, prepared as above, stable preparations of colloidal mercurous oxide are obtained.—Kolloid. Zeitsch.; through C. U. C. P. Al. J., 23 (1916), 233. (G. C. D.)

Mercuric Chloride.—*Antidotes.*—B. Fantus says that egg albumin is of little value as an antidote to mercuric chloride, unless it is given immediately after the poison is swallowed. Milk and serum albumin are worthless. Hall's solution (potassium iodide and quinine) is useless as an antidote. Sodium bicarbonate and sodium acetate possibly have a moderate antidotal value. Sodium carbonate, potassium bitartrate and sodium sulphate have no antidotal value. Stannous chloride has a little antidotal value. Calcium sulphite is probably too toxic to be of use as an antidote. Sodium phosphite taken alone has no antidotal value; but mixed in a certain proportion with sodium acetate it has antidotal efficiency. Sodium hypophosphite mixed with a certain proportion of sodium acetate or of hydrogen dioxide is also highly efficacious as an antidote. As the result of his studies, Fantus recommends the following antidotal treatment for mercuric chloride poisoning; immediate administration of a tablet composed of sodium phosphite 0.36 Gm., and sodium acetate 0.24 Gm. If this is not available, give the following: sodium hypophosphite, 100 Gm.; water, 10.00 mils, and solution of hydrogen dioxide, 5.00 mils. If the amount of the poison taken be known, ten times as much of the hypophosphite should be given as poison was taken. As this might require a large and possibly harmful amount of hypophosphite, it should immediately be followed by copious lavage, with a very dilute solution of the antidote. This may be followed by a safe dose of the antidote, which is to be retained, which might be repeated every eight hours for several days.—Journal of Laboratory and Clinical Medicine; through J. Am. Med. Assoc., 67 (1916), 1184. (W. A. P.)

Mercuric Chloride.—*Assay in Surgical Dressings.*—A method of estimating mercuric chloride in surgical dressings which depends on the precipitation of mercuric chloride with potassium iodide and redissolving the precipitate in an excess of the reagent has been recommended by Dulière. Ten grammes of the dressing are moistened with 15 grammes of water, and to the moist dressing a solution of potassium iodide (12.25 grammes in 1000 mils) is added from a burette until the red color of mercuric iodide has disappeared. Each mil of potassium iodide solution corresponds to 3 milligrammes of mercuric chloride. When the dressing contains mercurous chloride, yellow mercurous iodide is formed, which in turn is decomposed into metallic mercury which imparts to the dressing a gray color.—Rep. pharm.; through Drug. Circ., 60 (1916), 274.

Mercury Oxychloride.—The Dutch Pharmacopœia directs examining sodium bicarbonate for carbonate by adding to a solution of one gramme of the salt in 15 mils of water 3 mils of an aqueous corrosive sublimate solution (1 : 20) when in the presence of bicarbonate a reddish precipitate is produced. T. C. N. Broeksmith reports that such a precipitate is not always formed, that frequently at most only an opalescence is produced. When the opaque liquid is filtered and the clear liquid is heated on a water-bath a crystalline brown precipitate is formed with the evolution of carbonic acid gas. The yield is about 50 per cent. of the corrosive sublimate used. Heated in a glass tube, this precipitate, which is insoluble in water, alcohol, ether, glycerin and petrolatum, but insoluble in diluted hydrochloric acid and nitric acid and in potassium iodide and potassium bromide solutions with the formation of double salts, is decomposed into mercuric chloride and metallic mercury. Caustic potash solution colors the salt yellow, while ammonia produces a grayish white color. It is soluble in ammonium chloride solution with the evolution of ammonia gas. When an excess of ammonium salt is present the solution remains clear. An estimation of both the mercury and the chloride showed that the salt has the composition $HgCl_2.HgO$.—Pharm. Weekblad, 53 (1916), 993. (H. E.)

Mercury Salicylate.—*Electrolytic Assay of.*—B. L. Murray states that the following assay is rapid, convenient and reliable: About 0.3 gramme of the salicylate is weighed into the mercury cathode dish and dissolved in 10 mils of sodium sulphide

solution of sp. gr. about 1.18. To this solution are added 20 mils of 10 per cent. potassium hydroxide solution. The mixture is now electrolyzed, using a current of 1 ampere at 7 volts until the mercury is completely deposited, usually about half an hour being required. The anode should rotate about 500 revolutions per minute. After deposition, the electrolyte is decanted, the mercury is washed with water until free from alkalinity, then with alcohol, finally with ether, and then weighed.—J. Ind. Eng. Chem., 8 (1916), 258.

ALUMINUM.

Aluminum.—*Action of Boiling Acetic and Other Acids.*—The trouble experienced in the use of aluminum stills for the concentration of acetic acid led R. Seligman and P. Williams to investigate the matter. Experiments proved that presence of air was not a governing factor, the concentration of the acid finally being shown to be the cause of the pitting. Whereas 90 per cent. acid has only a slight action upon the metal, 100 per cent. acid has a very rapid and serious corrosive effect. Anhydrous butyric acid was observed to act similarly to anhydrous acetic acid upon aluminum, while propionic and formic acids also attack it, the latter even in 70 per cent. strength. Under certain conditions of temperature and moisture, the mixed acids forming stearic acid also have a corrosive action. The purest aluminum is more prone to attack than the less pure metal, although traces of copper increase its liability of attack by acids. Incidentally the authors discovered a new insoluble gelatinous basic aluminum acetate.—Chem. and Drug., 88 (1916), 53. (K. S. B.)

Aluminum.—*Action of Hydrogen Dioxide.*—Droste reports that an aluminum cup in which diluted hydrogen dioxide solution had been kept rapidly scaled and became friable. An analysis of the metal showed that it contained 99.46 per cent. of aluminum, 0.03 per cent. of iron, and 0.51 per cent. of silicon. When aluminum foil or aluminum turnings were exposed to hydrogen dioxide solution the former was dissolved within thirty days, the latter within forty-five days. A white, flocculent precipitate of aluminum hydroxide was formed, interspersed with small black particles consisting of aluminum containing silicon. The author therefore advises not to use aluminum containers for liquids which contain free oxygen or which split off this gas on standing.—Chem. Ztg.; through Drug. Circ., 60 (1916), 211.

Aluminum.—*Action of Tetrachlorethane upon.*—S. G. Sastry finds that tetrachlorethane acts readily upon aluminum in the presence of moisture due to the production of hydrochloric acid.—Chem. and Drug., 88 (1916), 53. (K. S. B.)

Aluminum.—*Calorization.*—Van Aller invented a process, which he named "calorization," by which he plunges a metal into a hot solution containing powdered aluminum. A protection layer of an aluminum alloy will be formed on the surface, the thickness depending upon the duration of the process. It is very advantageous for wires of the resistances utilized in electric heating, for iron apparatus heated above red heat, etc.—Sc. Am. Suppl., 1916, No. 2103. (O. R.)

Aluminum Hydroxide.—*Adsorption by.*—M. A. Rakuzin finds that when taken in sufficient quantity, aluminum hydroxide always adsorbs a definite percentage of albuminous substances. Comparing the known reactions of adsorption, they may be classified as irreversible, complete, and fractional. The treatment of cholera with white bole and the adsorption of toxins from sera are doubtless similar to the adsorption of albumins by aluminum hydroxide.—J. Russ. Phys. Chem.; through Pharm. J., 97 (1916), 593.

Aluminium Nitrate.—*Hydration.*—By treating aluminium with cold nitric acid, sp. gr. 1.42, hot nitric acid, sp. gr. 1.42, and cold nitric acid, sp. gr. 1.5, R. Seligman and Percy Williams obtained aluminium nitrates containing 18, 12 and 15 or 16 molecules of water.—Chem. and Drug., 88 (1916), 45. (K. S. B.)

Bolus Alba.—*Use as Poultice.*—Bolus alba sterilisata is recommended as a cheap substitute for the various antiphlogistins. For veterinary practice Kranich recommends the following: 4 parts of bolus alba and 5 parts of glycerin are thoroughly mixed and then heated at a temperature sufficiently high to destroy micro-organisms. After cooling to about 50° C., the paste is at once applied, and covered with a layer of cotton and bandage. It is claimed that if properly applied and protected the paste will hold its warmth for a considerable period.—C. U. C. P. Al. J., 23 (1916), 35. (G. C. D.)

Bolus Alba.—*Evaluation of.*—Rapp suggests tests for the determination of the quality of bolus alba (or argilla) now used largely in Germany as an adsorbent in intestinal troubles. He states that

2.5 to 5 grammes should decolorize in 1 minute 100 mils of a 0.1 per cent. solution of methylene blue; that the water absorptive capacity of the clay can best be determined by inserting into a jar containing 100 grammes a weighed piece of raw potato and after 1 to 3 days the piece of potato is removed free as far as possible from adherent clay and then weighed, the loss in weight being the moisture absorbed by the clay. Strong heat materially increases the adsorptive power of the clay.—Pharm. Ztg., 61 (1916), 355; through Chem. Abstracts (1917).

Mud.—*Therapeutics of.*—Kobert and Triller object to the statement of Winckel that a substantial part of the therapeutic action of mud is due to the tannins formed therein. The authors insist that presence of humus substances in mud cannot be doubted though they are not always present, and that though ferrous salts are inactive, it is not so with the ferric salts. Biological investigations have shown that three groups of substances (astringents) are responsible for the therapeutic action of mud baths: soluble aluminum salts, soluble ferric salts and free humus acids; at least these may be present. These three factors must be determined quantitatively for each mud bath. Chemical analysis and biological evaluation by means of blood corpuscles furnish the necessary information.—Z. Balneologie, 9 (1916), 24; through Chem. Abstracts (1917).

Fullers' Earth.—*Use in Intestinal Disorders of Infants.*—The use of kaolin has been recommended for the treatment of enteritis, in furunculosis and in vaginitis, and for application in infections of the nose and throat. Influenced by favorable reports, Alfred F. Hess prescribed kaolin in the intestinal disorders of infants. For this purpose it was either mixed with the milk or was given by the teaspoon. The results in either case were disappointing. In normal infants, kaolin occasioned only a slight degree of constipation, and in those manifesting diarrhea it was found not to reduce the number of stools materially. Dissatisfied with the results of kaolin, Hess used fullers' earth. Different specimens varied markedly in character. The value of these earths in the intestinal tract cannot be determined by their ability to adsorb dyestuffs. One ounce of fullers' earth was given in the day's feeding. This mixture was taken without difficulty by the infants, and was found to occasion no disorder whatsoever. Its sole effect, which may be stated to have been constant, was that it induced constipation. The preparation was then given to infants

suffering from indigestion, as manifested by diarrhea, accompanied in some instances by vomiting; it has a greater effect on inhibiting the diarrhea than has bismuth, chalk mixture or other drugs which are commonly used for this purpose. In some cases it has also seemed to exert a sedative effect on the stomach, as judged by the fact that vomiting ceased in the course of this treatment. In no instance were any harmful effects noted.—J. Am. Med. Assoc., 67 (1916), 106. (W. A. P.)

Kaolin.—*Use to Remove Diphtheria Bacilli from the Nose and Throat.*—In a preliminary note, the use of kaolin to remove bacteria from the nose and throat was suggested by L. Hektoen (see Year Book, 1915, 219) on the basis that kaolin by means of its adsorptive property would carry with it bacteria with which it came in contact. As crude kaolin, according to B. Rappaport, which is moist and lumpy, has not the adsorptive power of the thoroughly dried and finely powdered product, the crude material is first thoroughly dried for several days in a bacteriologic incubator. The lumps are then broken up and the powder passed through a fine flour sieve. This stock is kept in the incubator, and each morning the small amount necessary for the day's treatment is taken to the patient's room. On damp days it is necessary, for best results, to take kaolin from the incubator oftener—two or three times the day. The point of this is that kaolin must be perfectly dry and finely powdered when applied, else the results will be disappointing. When properly applied, kaolin, by its adsorptive power, mechanically removes bacteria with which it comes in contact, and its application to the nose and throat helps to remove diphtheria bacilli and to shorten the period of quarantine after diphtheria. This action of kaolin is interfered with by various local pathologic conditions, which must be remedied as promptly as possible. Removal of tonsils and adenoids is indicated when diphtheria bacilli persist unduly in spite of kaolin.—J. Am. Med. Assoc., 66 (1916), 943. (W. A. P.)

LEAD, GALLIUM AND GERMANIUM.

Lead.—*Atomic Weight.*—Coninck and Gérard determined the atomic weight of lead oxide, prepared from pure lead nitrate. From this they deduce that the atomic weight of the metal is 206.98. In 1904 the International Commission adopted 206.9 as the atomic weight. They have also determined the atomic

weight of lead extracted from uraniferous minerals. After eliminating as far as possible any lead which was not of radio-active origin, they find the atomic weight of radio-active lead to be 206.71, which closely approximates that found by Hönigschmidt and Horowitz, 206.73.—Compt. rend.; through Pharm. J., 97 (1916), 523.

Gallium.—*Presence in American Spelter.*—Hillebrand and Sherrer report the examination of a sample of crude gallium obtained from F. G. McCutcheon, of the Bartlesville (Okla.) Zinc Co., who states that 12,000 pounds of spelter yielded only a few grammes of the gallium alloy. The authors found it to contain, besides gallium, somewhat less than 1 per cent. of indium and traces of zinc and calcium.—J. Ind. Eng. Chem., 8 (1916), 224.

Gallium.—*Purification.*—Uhler and Browning found that on electrolyzing a solution of gallium hydroxide in sodium hydroxide, cooled to 0° C., gallium was obtained in an arborescent form, instead of liquid globules. The cathode consisted of platinum wire sealed in a glass tube, and allowing about 2 mm. to project at the lower termination. The authors reproduced and described the spectrum of gallium, as well as photographs of the gallium trees. A product of great purity was obtained by a number (10) of successive crystallizations of cæsium-gallium alum. By heating gallium in a current of dry hydrogen, using the full Bunsen heat, zinc may be entirely eliminated by volatilization.—Am. J. Sci., 42 (1916), 389. (G. C. D.)

Germanium.—*Presence in American Zinc Ores.*—G. H. Buchanan has obtained from zinc blende found in Wisconsin, 0.25 per cent. of germanium oxide. The material was extracted with strong hydrochloric acid, and the acid solution was distilled in a current of chlorine. On slightly diluting with water and passing hydrogen sulphide through the liquid, germanium sulphide was thrown down as a white precipitate. If the acid solution was too freely diluted, this precipitation did not occur, since germanium sulphide is distinctly soluble in water and in alkali, and is precipitated from strong acid solutions. Positive indications of the presence of germanium were obtained from some other specimens of zinc ores, but in none did the amount approach the quantity found in the sample of material reported on.—J. Ind. Eng. Chem., 8 (1916), 585.

ARSENIC.

Arsenic.—*Detection.*—The well-known action of arsine on corrosive sublimate paper is also produced by stibine and hydrogen sulphide. In order to distinguish the stains from each other, Schulz recommends washing the stain produced on the paper impregnated with the alcoholic corrosive sublimate solution for 15 minutes with a mixture of 10 Gm. of corrosive sublimate in 70 mils of alcohol and 10 mils of hydrochloric acid, sp. gr. 1.19, which does not act on an arsenic stain but removes stains produced by antimony and hydrogen sulphide. By washing out the excess of corrosive sublimate from the paper with acidulated alcohol and impregnating the paper with acidulated collodium the stain may be preserved as corpus delicti for any length of time.—Z. Nahr. Genussm.; through Pharm. Weekblad, 53 (1916), 1078. (H. E.)

Arsenic.—*Detection in the Hair.*—G. Meillère has given much attention to arsenical poisoning in the industries and finds the simplest way to detect traces of arsenic in the individual workmen is in their hair. Only 2 grammes of hair are necessary for arsenical detection, since strands of hair are in truth organs of elimination and, moreover, the dust and vapors of a factory cling more readily to the hair than to the skin. The sample of hair is decomposed by boiling in a mixture of sulphuric and nitric acids and after a colorless fluid is obtained it is diluted with water, heated until the oxides of nitrogen are eliminated and the resulting acid solution is then subjected to Marsh's tests. The article gives a picture of the special flask devised by the author for generating arsine under reduced pressure.—J. pharm. chim., 14 (1916), 5.

Arsenic.—*Poisoning by.*—A peculiar case of arsenic poisoning is noted in the 1914 Report of the British Inspector of Factories. The workmen, after cleaning a saturator in an ammonium sulphate plant, placed an acid residue containing a large amount of arsenic —apparently derived from the sulphuric acid used—in a galvanized iron pail. The acid in the residue reacted with the zinc lining, generating hydrogen which combined with the arsenic forming AsH_3, thereby poisoning the workmen. Only wooden or fiber pails should be used for such work.—The Engineer; through Sc. Am. Suppl., 1916, No. 2112. (O. R.)

Arsenic.—*Precaution in Marsh's Test.*—W. Vaubel and A. Knocke state that fresh hypochlorite solution must be used in testing the solubility of the spot produced in Marsh's test to de-

termine whether it is antimony or arsenic. In old solutions, chlorite is apparently formed; chlorite solutions act as a solvent for antimony spots.—Chem. Ztg.; through Pharm. Ztg., 61 (1916), 245. (J. H. W.)

Arsenic.—*Reason for Tolerance by Arsenic Eaters.*—The long unsolved puzzle of arsenic tolerance is explained by Joachimoglu to be due to the mucous cells of the gastro-intestinal tract becoming accustomed through long exposure to the caustic action of the arsenic. A steady use of arsenic is, however, not possible without its penalty.—Pharm. Ztg., 61 (1916), 108. (J. H. W.)

Potassium Arsenite.—*Composition of the Commercial.*—While it has been generally supposed that commercial potassium arsenite is $KAsO_2,H_3AsO_3$, Vanderkleed and E'we found that an American brand assayed 99.2 per cent. $KAsO_2$.—J. Am. Pharm. Assoc., 5 (1916), 718.

ANTIMONY.

Antimony.—*Production in Alaska.*—The high price of antimony has stimulated the mining of stibnite ores, considerable quantities of which are now being worked in the Fairbanks district, and the Seward Peninsula, in Alaska. The total shipment of antimoniferous ores from Alaska during 1915 is valued at $170,000. All the mining operations at that date were on a small scale, working in open cuts and digging out the ore from shoots, "kidneys," and irregular masses. Most of this ore was broken and hand sorted, and none was shipped containing less than 50 per cent. of antimony. More recent demands for the metal have increased prospecting for the ore. Stibnite is not uncommon in Alaska, and it seems probable that the new industry will show considerable development.—Mining J.; through Pharm. J., 96 (1916), 623.

Antimony Pentachloride.—*Action on Iodine.*—Otto Ruff finds that solid iodine reacts rather slowly and incompletely with antimony pentachloride unless used as a fine powder and with stirring. Depending on the quantity of iodine and the conditions, the reactions are as follows:

$$SbCl_5 + I_2 = SbCl_3 + 2ICl$$
$$2SbCl_5 + I_2 = SbCl_3,2ICl + SbCl_3$$
$$2SbCl_5 + 2I_2 = SbCl_3,3ICl + SbCl_3 + ICl$$

The two antimony trichloride-iodine chloride combinations crystallize in prisms or needles and are bluish black or dark violet with reflected light and orange-red with transmitted light. They are readily soluble in cold water, in carbon tetrachloride and in chloroform. They are very hygroscopic, fume in the air and liquefy. —Ber.; through Apoth. Ztg., 31 (1916), 6. (J. H. W.)

Tartar Emetic.—*Use in Cerebro-spinal Fever.*—S. Neave was induced to try tartar emetic for cerebro-spinal fever after reading of Sir Leonard Roger's success with it in kala-azar, intravenous injection being the method used. Half a grain administered in two cases produced very beneficial results.—Lancet; through Pharm. J., 96 (1916), 577.

Tartar Emetic.—*Incompatible with Sodium Bicarbonate.*—The A. M. A. Laboratory reports that when an aqueous solution of tartar emetic is added to a solution of sodium bicarbonate a clear solution results at first, but that on standing a precipitate of antimony hydroxide is formed.—J. Am. Med. Assoc., 67 (1916), 462. (W. A. P.)

BISMUTH.

Bismuth.—*Atomic Weight.*—Coninck and Gérard obtained from a special metallurgical laboratory a specimen of bismuth which contained sulphur and arsenic. They purified it by fusing several times with saltpetre and transforming the bismuth into chloride. This was then reduced by hydrogen which had been purified by passing through two solutions of permanganate (one warm), concentrated soda solution, and pure sulphuric acid. The bismuth chloride and the pure bismuth were weighed. If the weights are p and p', respectively, the atomic weight is given by the equation $\frac{x + 106.5}{x} = \frac{p}{p'}$. Four determinations were carried out, and the mean was found to be 208.50, which is the value adopted by the International Commission.—Compt. rend.; through Chem. News, 113 (1916), 167.

Bismuth.—*Purification.*—Mylius and Groschuff state that silver, lead, and copper have been found in commercial samples of reputedly pure bismuth; tin, nickel, zinc, and platinum are also present in certain cases. Samples of electrolytic bismuth contained platinum and silver, and traces of lead, copper, and zinc. Purification is best effected by crystallization of normal bismuth ni-

trate from acid aqueous solution, and of the metal from the fused impure metal. The purest bismuth obtained melted at 271° C.—Z. anorg. Chem.; through Pharm. J., 97 (1916), 509.

Bismuth.—*Toxicity.*—Bismuth is not the innocuous drug once described, but to some individuals may prove to be most dangerous. Sixty-five cases reported by William H. Higgins, of poisoning with twenty-four fatalities, should serve as a warning against its indiscriminate use. Even Beck admits that of the 1,100 cases treated by him, 30 per cent. showed pigmentation of the gums thus indicating the adsorption of the bismuth and its potentially toxic effects. It has an unmistakable action on the kidneys and other organs in susceptible individuals.—J. Am. Med. Assoc., 66 (1916), 648. (W. A. P.)

Bismuth Betanaphthol.—*Electrolytic Assay of.*—B. L. Murray finds the following bismuth assay highly useful:

A sample of 0.3 gramme is weighed into a porcelain crucible and heated very gently to decomposition of the substance. The crucible is finally heated to a full red heat for three minutes to burn off the last traces of carbon; the residue is yellow in color and is composed chiefly of bismuth oxide with a small quantity of metallic bismuth. The crucible is placed in a small beaker and a mixture of 4 mils of nitric acid (sp. gr. 1.4) and 5 mils of water is added, after which it is heated on a steam-bath to complete solution. This is washed with distilled water into a mercury cathode cup, keeping the volume down to 20 mils. The cup is conveniently made from a 50 mil Erlenmeyer flask. The 20 mil solution is then electrolyzed under the following conditions: current (maximum), 4.5 amperes at 6 volts; revolutions per minute, 1,000; time, 45 minutes. The initial application of the current is 1 ampere, gradually increased to 4.5 amperes. When the black masses formed disappear, the rotation is stopped, and the cathode washed with distilled water by syphoning while full current is on. The electrolyte should be tested for bismuth with hydrogen sulphide. After two or three washings with water, followed by alcohol, and then by ether, the mercury cathode is weighed. The increase in the weight of the mercury cathode is due to the bismuth which has been deposited on and amalgamated with the mercury.—J. Ind. Eng. Chem., 8 (1916), 257.

Bismuthum Carbonicum.—*Test.*—P. Bohrisch dissolves 0.5 gramme of the salt in 5 mils of nitric acid, warming if necessary. When the resulting solution is mixed with 500 mils of tap water there first appears a turbidity and later a distinct white precipitate. If distilled water is used, the mixed fluid remains clear until sodium chloride or ammonium chloride is added.—Apoth. Ztg.; through Pharm. Zentralhalle, 57 (1916), 255.

Bismuth Subgallate.—*Use in Combination with Antitetanic Serum.*—Merieux states that the various microbes associated in nature with tetanic spores favor the evolution of tetanus by hindering the destruction of the latter by phagocytosis, and thus allow these germs to develop freely and to elaborate their toxin, which is rapidly diffused in the organism. The local application of a mixture of dried serum and of bismuth subgallate, made to the wound six hours after inoculation, arrests the evolution of tetanus in the guinea pig; whereas the application of dry antitetanic serum alone, to give the same results, must be made immediately or in the course of the first hour.—J. pharm. chim.; through Pharm. J., 96 (1916), 555.

MANGANESE.

Manganese.—*Crum's and Marshall's Tests for.*—L. Dobbin discusses the well-known test for manganese salts; boiling together a mixture of lead peroxide and diluted nitric acid and then adding the manganese solution, when a purple-red permanganic acid color results. This test has been variously called Crum's, Volhard's and Hoppe-Seyler's reaction and Robbin shows that Crum should be given the priority since his paper appeared in 1845 and both Volhard (1879) and Hoppe-Seyler (1863) in their papers on the subject gave Crum credit as discoverer. Likewise, Dobbin points out that the Marshall modification of Crum's test (substitution of ammonium persulphate for the lead peroxide) has been ascribed to Walters, although the latter in his paper on the subject (1901) gave the credit of the idea to Marshall.—Chem. News, 113 (1916), 133.

Manganese.—*As Found in Water.*—Vincent finds that manganese is dissolved in water by the carbonic acid present in the latter, a bicarbonate being formed similar to calcium bicarbonate. The bicarbonate, which has the formula $(CO_3)_2MnH_2$, exists only in solution.—L'Union Pharm.; through Drug. Circ., 60 (1916), 407.

Manganous Salts.—*Oxidation.*—Prandtl says that when a cold solution of a manganous salt is acidified in excess with strong hydrochloric acid, and a few drops of a solution of sodium nitrite added, the liquid assumes an intense brownish yellow color, owing to the formation of a manganic salt. The same result is obtained when cold strong hydrochloric acid is mixed with a small quantity of the nitrite solution, and a few drops of a manganous solution added. When a neutral solution of a manganous salt is mixed with sodium nitrite (neutral) in excess and oxalic acid added, an intense cherry-red coloration is noted, owing to the formation of manganic oxalate. This reaction is said to be extremely sensitive and to be of value in the detection of small quantities of manganese in presence of larger quantities of iron.—C. U. C. P. Al. J., 23 (1916), 250. (G. C. D.)

Manganese Sulphides.—*Different Varieties of.*—M. Fischer finds that green manganese sulphide occurs only when manganese salts are precipitated by ammonium sulphhydrate from a solution containing an excess of ammonium chloride and some free ammonia. According to conditions of precipitation, the green sulphide is either anhydrous or contains 17 per cent. of water. If alkaline sulphides are used as precipitants, manganese salts are thrown out of solution as flesh-colored sulphides. When manganese salts are precipitated from acid solution with hydrogen sulphide, red or orange sulphides are obtained.—J. Russ. Phys. Chem.; through J. pharm. chim., 13 (1916), 55.

IRON.

Cast Iron.—*Sulphur Content.*—E. Leber in "Stahl und Eisen" states that a higher sulphur content causes a rise in strength in cast iron and also an improvement in flexibility. The tendency to the formation of cavities, caused by the transition from the molten to the solid state, is overcome by pouring the iron as hot and as quickly as possible.—Sc. Am. Suppl., No. 2107, May 20, 1916. (O. R.)

Galvanized Iron.—*Preparation.*—Since the outbreak of the war, copper has been largely replaced by galvanized iron in Germany. Galvanizing may be effected by the hot process, the electrolytic process, Schoop's metal-spraying process or by sherardizing. Sheet iron galvanized by the hot process contains about 400 Gm. of zinc per square meter, instead of 1 kilo as formerly. Electrolytically

galvanized sheet iron has a coating of 200 Gm. of zinc per square meter, which seems sufficient to prevent rust. A great advantage of this latter process is that it reveals defects, such as fine cracks in the iron, which would be concealed by hot galvanizing. Sherardizing is particularly suitable when it is desired to preserve the finest detail of the article, *e. g.*, screws. This process is also used in making the 5-pfennig galvanized iron coins, recently introduced in Germany, in place of the nickel pieces.—Sc. Am. Suppl., 1916, No. 2108. (O. R.)

Iron.—*Ancient Hardening.*—Sir Robert Hadfield discovered an iron chisel which dates back to the early period of the Christian era, in the Colombo Museum in Ceylon. The chisel, upon analysis, was found to be practically pure iron. The explanation for the hardened point is that the wrought iron was imbedded in a charcoal fire and thereby a certain amount of carbon was absorbed by the point, which, upon quick cooling, resulted in a cutting edge.—Sc. Am. Suppl., 1916, No. 2106. (O. R.)

Iron.—*Colorimetric Assay in Pharmaceuticals.*—In a highly interesting paper, J. L. Mayer compares the results obtained by employing an adaptation of the colorimetric method of determining iron in water, to determining iron in beef, iron and wine, with several volumetric and gravimetric methods. He reports very excellent agreements with the volumetric methods used and that the method of precipitating the iron as hydroxide and weighing as oxide is apt to give high results. The technic of the methods used is given.—Am. Drug., 60 (1916), 169. (B. J. D.)

Nickel Plating.—*Rapid Process.*—Olin P. Watt points out the progress made in nickel plating. During half a century nickel plates were content to follow in the footsteps of their forefathers and deposit nickel at the snail's pace of 3 to 5 amperes per square foot. A few years ago "Rapid Nickel Salts," imported from Europe, permitted nickeling at 2 to 3 times the usual rate. These double sulphates proved to be only mixtures, capable of yielding more concentrated solutions. The American plater soon learned how to make up his own rapid solutions, doing nickeling at 10 to 20 amperes per square foot. Owing to the peculiar properties of electrolytic nickel, the advantages of a hot over a cold solution are greater in nickel plating than in the deposition of any other metal. The author points out 6 advantages of a hot over a cold solution.—Sc. Am. Suppl., 1916, No. 2118, 90–91. (O. R.)

PLATINUM.

Platinum.—*Production in Germany.*—The first platinum works in Germany are operating with success in Thuringia. The Thuringian iron ores appear to contain a large quantity of platinum.—Südd. Apoth. Ztg.; through Chem. and Drug., 88 (1916), 705. (K. S. B.)

Platinum.—*Production in Spain.*—The occurrence in Spain of small quantities of platinum has been recorded several times but the amount of that metal present in the deposits has been so minute as to be of no practical importance. It is quite otherwise with the recent discovery of an important platiniferous district described by de Orneta and de Rubies. This occurs in the Ronda range in Andalusia, between Malaga and Gibraltar. The rocks here are peridotitic, resembling closely those of the platiniferous regions of the Urals, and contain layers of dunite, $Fe_2SiO_4 + 11Mg_2SiO_4$, identical with that found in the Ural platinum deposits. These Spanish rocks also contain chromite in the same proportion as those in the East. Some trials of the dunitic outcrops in the Taguil region of the Ronda have given most encouraging results. The assays have varied from traces to 28 Gm. of platinum per cubic meter of platiniferous sand, and fifty trials have given a mean of 3 Gm. of platinum for that quantity. Since the area of the deposits is so large—the central zone of the formation being 72 kilometers long and 20 kilometers across—the matter has been taken up by the Spanish Government, who are undertaking the necessary preliminary work with a view to future commercial development.—Compt. rend.; through Pharm. J., 96 (1916), 193.

ORGANIC CHEMISTRY

GENERAL SUBJECTS.

Carbon and Bromine.—*Simultaneous Estimation by the Chromic Acid Method.*—In an extension of a paper previously read on a method of estimating halogens in organic compounds by treating with chromic and sulphuric acids, and then absorbing the liberated halogens in alkali, from which they are precipitated with silver nitrate, and weighed, P. W. Robertson states that under these circumstances the carbon is evolved as volatile carbon compounds, which, on passing through a short length of heated silica tubing packed with platinized asbestos, are completely oxidized to carbon dioxide. The products of oxidation are driven forward by means of carbon-dioxide-free oxygen. In presence of halogens, 1.3 N alkali is used, and the first tube contains a small quantity of sodium sulphide. After the reaction is complete the absorption tubes are washed out and the solution precipitated with barium nitrate to remove the carbonate. It is then titrated with standard acid, and finally precipitated with excess of silver nitrate and nitric acid and titrated with potassium thiocyanate. The first titration gives the total carbon dioxide and bromine, while the second gives only the bromine. From these two the content of carbon and bromine may be calculated. When chlorine is present it is evolved as chromyl chloride, which is completely destroyed in the heated silica tube. By using standard baryta to absorb the carbon dioxide, very small quantities of the substance may be used, as baryta is readily titrated with standard weak acid.—Chem. and Drug., 88 (1916), 55. (K. S. B.)

Nitrogen.—*Determination by Kjeldahl's Method.*—O. Nolte recommends replacing mercury by copper as catalyzer, because even when mercury is eliminated by the addition of sulphide, too low results are liable to be obtained, especially with substances like caffeine, uric acid, etc. For some as yet unknown reasons, possibly the action of SO_2, slightly low results are also liable to be obtained when copper is used as catalyzer.—Z. anal. Chem.; through Pharm. Weekblad, 53 (1916), 1078. (H. E.)

Catalytic Hydrogenation of Organic Compounds.—*Use of Common Metals at Room Temperature.*—By the use of platinum or palladium according to the methods of Paal, Paal-Skita and Willstätter, hydrogenation may be readily accomplished at room tem-

perature under atmospheric pressure. If these noble metals, writes C. Kelber, are, however, replaced by base ones, high pressures and high temperatures—or with low temperatures, reduced catalysts—appeared to be absolutely necessary.

The author has, however, found that with proper preparation of the catalytic material reduced base metals are highly satisfactory for hydrogenation at elevated temperatures also. As carriers of the reduced metals he found infusorial earth and the hydrosilicates of aluminum and magnesium marketed under different names to act very well. Various charcoals, such as those of blood and linden wood, were found serviceable.

The hydrogenation may be accomplished in aqueous or hydroalcoholic solution. The trials were conducted with reduced nickel. Cobalt may be used instead with satisfactory results, the hydrogenation being somewhat slower.—Ber.; through Apoth. Ztg., 31 (1916), 33. (J. H. W.)

Organic Plant Products.—*Microchemical Detection.*—In a well-illustrated article, O. Tunmann interestingly discusses the detection of the sugar alcohols, of some plant acids, of fatty acids, oils and fats, of hexoses and saccharoses, of inulin and glycogen.—Mikrokosmos; through Pharm. Ztg., 61 (1916), 245. (J. H. W.)

Synthetic Organic Drugs.—*Production in England.*—At the annual meeting of the Society of Chemical Industry, F. H. Carr pointed out that Great Britain, the home of coal tar, is at least as favorably situated as any country for the manufacture of organic chemicals. Some form of protection, however, is of vital necessity during the coming ten years, while we develop a complete organization and rectify educational shortcomings. Without this protection, what has already been accomplished will rapidly and completely be demolished by competition from abroad. Each branch of chemical industry must have representatives who will define the extent of their requirements from other branches, which in their turn must co-operate. The Association of Chemical Manufacturers is looked to, to take the lead. The full development of the manufacture of synthetic drugs will be determined by the dye industry. With a large dye industry, the supply of intermediates would be assured.—Pharm. J., 97 (1916), 114.

Alkaloids.—*Production in England.*—At the same meeting, D. B. Dott stated that although Britain has for long been a producer of opium alkaloids and quinine, and more lately of caffeine, strych-

nine, emetine, and veratrine, Germany has been a larger manufacturer of all these bases, except morphine, while the preparation of atropine and most of the rarer alkaloids has been almost entirely in German hands. The prices of alkaloids in May, 1914, compared with those of May, 1916, show in every instance a rise varying from 63 per cent. in the case of morphine hydrochloride to 700 per cent. in the case of atropine sulphate, the average increase of price in eight of the more important alkaloids being 237 per cent. The making of alkaloids in this country, which were formerly made almost exclusively in Germany, has not yet attained considerable proportions, and the conditions are not favorable for embarking on new processes. Referring to the growing of medicinal plants in this country, the author thought that our climate and soil do not seem to be well suited for almost any of the alkaloid-yielding plants. The present time is thought to be a very favorable one for the production synthetically of those alkaloids that are in brisk demand, provided practicable working processes are available. There has been much elaborate and ingenious research in this direction, but the synthesis of the two most important alkaloids, morphine and quinine, remains still unaccomplished. The production of suitable substitutes is also considered, the use of which the scarcity of the natural alkaloids must tend to increase. One effect of the war will therefore be an indirect stimulus to the production of artificial alkaloids.—Pharm. J., 97 (1916), 114.

Narcotic Synthetics.—*Tests for.*—E. H. Hankin summarizes the color reactions obtained by such synthetics as cycloform, holocaine, orthoform, antipyrine, alypine, eucaine, novocaine, stovaine, tropocaine, chloretone, brometone, tetronal, trional, heroine, aconine, nirvarine, etc., with such reagents as nitric acid, Fehling's solution, sulphuric acid and potassium iodate, urotropine, and lastly bromine. The chemical constitution and melting points of the synthetics are given in the original paper.—India J. Medical Research, 4 (1916), 237; through Chem. Abstracts (1917).

Chemical Constitution and Odor.—*Relationship between.*—R. Marchand expresses the opinion that perfumes are compounds which contain oxygen in the form of a bridge atom (Kuppel atom); a second hydroxyl or a COOH–O– group lowers the perfume effect or inhibits it entirely. The attraction of 2 oxygen atoms in the molecule is nullified by the proximity of methyl groups, thus rendering the compounds odorless. Strongly odoriferous compounds contain double-bonded oxygen. The unfavorable influence of 2 oxygen atoms

as regards perfume effect is most favorable for disinfectant action. Nitrogen and oxygen influence their free valencies in that the toxic effect is lowered. All perfume effects are dependent on free valences. —Deut. Parfumerie-Ztg.; through Chem. Abstracts, 10 (1916), 2383.

Optical Rotation.—*Correct Expression.*—Dr. L. P. Sieg calls attention to the existing confusion in the textbooks on the direction of the plane of polarization. Thus cane sugar rotates this plane to the right, but the question arises as to what direction this really means. J. Walker in "Analytical Theory of Light," p. 344, gives the following correct explanation: "Among crystals of quartz there are some that rotate the plain of polarization from *left to the right of an observer receiving the ligh* . . . . , the former are called right-handed or dextrogyrate." A rotation to the right is consequently correctly defined as a clockwise rotation which appears to the observer looking *not along the direction, but against the direction* in which the ray is being propagated.—Sc. Am., Jan. 15, 1916, 79. (O. R.)

HYDROCARBONS.

Commercial Benzoles.—*Analysis.*—These usually contain toluene, benzene, paraffin and carbon bisulphide. Percy E. Spielman, in a paper on the subject, gives a method for their determination. When a sample is distilled at 90° C. the quantity of toluene that passes over is always proportionate to the quantity of toluene left in the flask. By taking two specific gravities, before and after the removal of the carbon bisulphide, that substance can be estimated, and thereafter the mixture of benzene and paraffin with the known quantity of toluene can be found by calculation.—Chem. and Drug., 88 (1916), 68. (K. S. B.)

Benzene.—*Discovery.*—An extract from a paper by Michael Faraday, "On New Compounds of Carbon and Hydrogen and on Certain Other Products Obtained during the Decomposition of Oil by Heat," read on June 16, 1825, before the Royal Society, is given, telling of the discovery of benzene.—Chem. and Drug., 88 (1916), 773. (K. S. B.)

Benzol.—*Objection as a Motor Fuel.*—A. Wayne Clark points out that benzol solidifies at 33° F. and consequently cannot be used as a motor fuel in northern countries. Of course this can be

prevented by the admixture of alcohol or gasoline. However, benzol, unlike water, does not expand on freezing, but contracts, and therefore it will not burst pipes or tanks.—Sc. Am., Sept. 23, 1916, 281. (O. R.)

Benzene.—*Its Solidifying and Melting Point.*—Robert Meldrum gives an account of an extended study of the vagaries of benzene during solidification and fusion. The average solidifying point was found to be 5.6° C., and the average melting point 5.7° C.

From the results of his investigations and the various published constants relating to benzene it would seem that this compound above the melting point exists in one or more modifications, the molecule becoming more complex, which is the main cause of variation in its constants. The apparent existence of solid colloidal benzene and solutions of same support this; also the slow rate of crystallization. There also seems to be some evidence from the author's observations which are not yet completed, that the melted crystals on keeping yield fractions with lower melting points than the crystals. Also the solidifying and melting-point method is more accurate in determining the purity of pure benzene than the boiling-point.—Chem. News, 113 (1916), 267. (J. A. K.)

Normal Nonane.—Latham Clarke and Roger Adams review the history and properties of normal nonane, C_9H_{20}, giving a modified method of manufacture from castor oil, showing the intermediary products formed. They compare the calculated percentage composition with that obtained by analysis.—Chem. News, 114 (1916), 3. (B. J. D.)

Liquid Petrolatum.—*American Varieties of.*—At a meeting of the Chicago branch of the American Pharmaceutical Association, Dr. R. E. Humphreys read a paper discussing the use of liquid petrolatum as a laxative; pointing out the difference between the Russian and American "white oils"; and describing the development of the American industry since the outbreak of the war. He emphasizes the fact that the tests of U. S. P. VIII were based on Russian oil exclusively and that an American product with different constants is in some cases even more effective than a Russian oil of the quality of U. S. P. VIII. He considers the "mixed acid test" and the ultraviolet test of the oil as unduly severe.—J. Am. Pharm. Assoc., 5 (1916), 304.

Liquid Petrolatum.—*Composition.*—As naphthene hydrocarbons predominate in Russian crude petroleums and paraffin hydrocarbons in many or most American crude petroleums, it was assumed that the petrolatums derived from these sources differed from each other in like manner. While both the naphthenes and paraffins are chemically inert, some unexplained therapeutic superiority has been asserted to reside in Russian liquid petrolatum. Benjamin T. Brooks, of the Mellon Institute, explains that most so-called "mineral oils" used for therapeutic purposes contain no paraffin hydrocarbons whatever and that, regardless of the source of the crude petroleum, the fraction which constitutes the liquid petrolatum is composed essentially of naphthenes and polynaphthenes.—J. Am. Med. Assoc., 66 (1916), 38. (W. A. P.)

Liquid Petrolatum.—*Detection of Unsaturated Hydrocarbons in.*—At the meeting of the Pharmaceutical Section of the American Chemical Society, Briggs and Irwin discussed the danger of the presence of unsaturated hydrocarbons in liquid petrolatum used as a laxative and of the importance of proper means of detection of this impurity. The new Pharmacopœia employes as test the shaking of 5 mils of the petrolatum oil with 5 mils of sulphuric acid, the mixture being warmed on a water-bath. Under such treatment, the sulphuric acid should not be colored. The so-called "mixed acid test" (no coloration when shaken with a mixture of equal parts of nitric and sulphuric acids) is applicable only to those liquid petrolatums that are free from hydrocarbons of the methane series which contain side-chains such as the Russian oil (for which it was devised) and the California oil. All other American oils contain side-chain hydrocarbons and hence would be rejected were the "mixed acid test" to be applied.

The authors experimented with the detection of unsaturated hydrocarbons through their bromine absorption value and obtained highly satisfactory results by use of the following procedure: Five mils of the oil are mixed in a 50 mil glass-stoppered cylinder with 5 mils of purified carbon tetrachloride and 5 mils of N/500 bromine solution. After standing 15 minutes in the dark, 3 mils of starch-potassium iodide indicator are added and the mixture is titrated with N/500 thiosulphate solution to a complete discharge of the iodine color from both layers. At the same time, a blank experiment is run and the actual amount of bromine absorbed by the petrolatum oil is thus deduced. Of ten samples of oil purchased in the open market, six absorbed 0.8 mil (or less) of N/500 bromine

solution to each five mils, showing less than $^{5}/_{1000}$ of 1 per cent. of unsaturated hydrocarbons. One poor grade of Russian oil, on the other hand, absorbed 19 mils N/500 bromine solution to each 5 mils.—J. Am. Pharm. Assoc., 5 (1916), 709.

Liquid Petrolatum.—*Use in Constipation.*—Le Tanneur points out that a vegetable oil is unable to serve as a lubricant for the feces until the amount ingested surpasses the dose normally saponified by the liver and pancreas. Hence to take olive oil for the purpose, as some recommend, imposes a useless burden on these organs. Liquid petrolatum, on the other hand, seems to traverse the alimentary canal without exciting any reflex action in the liver. He orders one or two tablespoonfuls a day, after dinner at night or before breakfast, keeping it up for two or three weeks, repeating the course as needed. The physician must realize, he declares, that in this he has a wonderful means at his disposal for keeping constipation under control without drastic measures. But he must impress on the patient that it is a course of treatment, aiming at a durable cure in time.—Paris Medical; through J. Am. Med. Assoc., 67 (1916), 473. (W. A. P.)

Liquid Petrolatum.—H. Bertoye finds that a mixture of liquid paraffin and petrolatum, or wax protects the tissues from injury, and prevents the dressings from sticking to the surface, so that the wound heals quicker. The paraffin can be medicated if desired. The spray can be applied without fear of infection by the hands, and is proving an ideal dressing for superficial lesions and mild burns, as well as for deep wounds after they have been cleared out and drained. Besides hastening healing, the paraffin spray relieves pain. There is no need to fear that the paraffin will hold back wound secretions, since the layer is easily lifted when these accumulate beneath it.—Lyon Medical; through J. Am. Med. Assoc., 67 (1916), 80.

Paraffin.—*Aromatic Hydrocarbons from.*—In an examination of the literature covering the cracking of paraffin wax into lower boiling hydrocarbons, Gustav Egloff and Thomas J. Twomey have nowhere found that aromatic hydrocarbons such as benzene, toluene and xylenes have been produced. From a study of the kinetics of the decomposition of the paraffin series Rittman concluded that such formation was indicated. Kramer and Bottcher commenting on the work of Thorpe and Young state that if a higher temperature

had been used the higher boiling olefines would have changed into benzene hydrocarbons but not naphthenes. The production of gasoline is carried on below 420° C. and 100 pounds pressure.

The cracking of paraffin wax by the gas-phase method—that is, by passing the vapors through a heated tube—was undertaken to confirm the authors' opinion that it is possible to form benzene, toluene and xylenes from paraffin wax under similar conditions which result in the formation of the same compounds from petroleum cracking.

The results of their experiments are summarized as follows:

1. It is possible to produce benzene, toluene and xylenes by the cracking of paraffin wax at 600° C. and atmospheric pressure, and at 500° and 600° C. and 150 lbs. pressure.

2. Under the same conditions of cracking aromatic hydrocarbons also result from petroleum oils of the paraffin type.

3. That the formation of aromatic hydrocarbons produced by the cracking of petroleum may not be ascribed entirely to the decomposition of the constituents of the petroleum which contain the phenyl group.

4. That there is a very close relationship between the members of aliphatic and aromatic series of hydrocarbons.

5. That oils containing paraffin wax are adapted for the commercial production of benzene and toluene.—J. Phys. Chem.; through Chem. News, 114 (1916), 216. (J. A. K.)

Paraffin.—*Effect of Temperature on.*—The density of pure paraffin varies from 0.848 to 0.875, but J. Peczalski has found that some specimens have a density higher than 0.900. This may be supposed to be due to the presence of impurities, or another explanation may be given. The author has observed that when paraffin is heated in a test-tube for some time to a temperature below its melting point it undergoes transformations, excavations becoming apparent throughout its mass. A paraffin of density 0.875 had density 0.900 after being heated for twenty-four hours. It also became translucid, while it was almost opaque before heating. The transformation is accompanied by a great diminution in the electric conductivity. Microscopic examination shows that heating induces crystallization of the superfused parts, increases the size of the crystals, and possibly changes their orientations.—Compt. rend.; through Chem. News, 114 (1916), 48.

Paraffins.—*Saponification.*—By heating petroleum distillates with lime and caustic soda, or by treating them with a mixture of sulphuric and nitric acids products are obtained which are soluble in alkaline solutions and in other ways resemble liquid fatty acids. Haack and others obtained 60 per cent. of saponifiable substance by treating the crude distillation products of petroleum with manganese and sulphuric acid under pressure.—Seifenfabrikant; through Chem. and Drug., 88 (1916), 70. (K. S. B.)

Naphthalene.—*Solubility in Ammonia.*—S. Hilpert finds that naphthalene is soluble in solution of ammonia of 5 per cent. strength in NH_3, to the extent of 0.030 Gm. per 1,000 Gm. of liquid; in 10 per cent. solution of ammonia, 0.042 Gm. per 1,000 Gm.; in 25 per cent., 0.064; in 100 per cent., 33.0 per 1,000 Gm. These figures are obtained at 0° C. At 25° C. the figures, respectively, are: 0.044, 0.074, 0.162 and 120.0 Gm. in 1,000 Gm. If the solution of ammonia contains 2 per cent. of pyridine the solubility of the naphthalene is increased by 0.082 Gm. at 0° C., and by 0.245 Gm. at 25° C. Phenol does not influence the solubility. A stream of carbon dioxide passed into .25 per cent. solution of ammonia containing dissolved naphthalene causes the greater part of the latter to be thrown out of solution. The distillation of solution of ammonia containing naphthalene in solution results in blocking of the condenser tubes unless these are kept at a temperature not lower than 30° C.—Z. angew. Chem.; through Pharm. J., 96 (1916), 521.

Ichthyol Substitutes.—*French Sulphur-Containing Oils.*—Demesse and Réaubourg describe the bituminous shale obtained in Saint Champ, Ain, France. Their analysis shows that it contains 3 per cent. of clay, 2.6 per cent. of ferric oxide, 3.3 per cent. of magnesium oxide, 45 per cent. of calcium oxide, 0.2 per cent. of sulphur trioxide, 0.2 per cent. of phosphoric oxide, 38.6 per cent. of CO_3 radicle and 6.70 per cent. of oil and bituminous matter. By dry distillation there is obtained an oil containing 9.2 per cent. of hydrogen, 77.3 per cent. of carbon, 11.99 per cent. of sulphur, 1.14 per cent. of oxygen and 0.37 per cent. of nitrogen. Redistillation yielded a sulphur-free fraction passing over at 80 to 100°, a fraction boiling between 100° and 260° resembling Baumann and Schotten's "ichtyol" and an easily sulphonated fraction boiling above 260°—Bull sci. pharmacol.; through Chem. Abstracts, 10 (1916), 2024.

VOLATILE OILS AND DERIVATIVES.

Essential Oil Analysis.— *Use of Formic Acid in.*—W. H. Simmons discusses the use of formic acid in determining relative amounts of the various perfume alcohols in volatile oils. He already reported (1913) on certain phases of the subject and he now states that terpineol is completely decomposed by formylation, that geraniol and linalol are both converted into formyl esters and that santalol is only partially decomposed. He believes that the use of formic acid as a reagent is of value in the examination of geranium oils and promises to be of service in rosemary oil and peppermint oil assays. —Analyst; through Chem. Abstracts, 10 (1916), 664.

Essential Oils.—*Analysis.*—A paper entitled "A Critical Survey of Technical Essential Oil Analysis," by T. H. Dirrans, describes concisely the methods of adulteration and analysis. A table of adulterants is also given.—Journal of Chemical Technology; through Chem. and Drug., 88 (1916), 576. (K. S. B.)

Volatile Oils.—*Dictionary of.*—J. C. Umney publishes a compilation of 1318 species of plants from which essential oils have been obtained, the part used, the yield, and the density optical rotation, and chief constituents of the oils, together with literature references. A list of the common names of some of the plants is appended.—Perf. Essent. Oil Record; through Chem. Abstracts, 10 (1916), 2122.

Essential Oils.—*Effect of Light during Iodine Value Determination.*—The effect of light upon the iodine value of essential oils has been studied by Maveille, who found that most oils gave lower values when exposed to light during the operation, although some oils, such as that from anise, gave higher results in light than in darkness. For this reason he considers the influence of light to be of great importance, and suggests simultaneous determinations, one in light and the other in darkness. A higher value when taken in presence of light would indicate the presence of some such oil as that from anise. In the dark a sample of anise oil gave a value 1.41 in 24 hours, rising to 1.65 in 96 hours. In the light the same sample gave 2.03 in 30 minutes, falling to 1.96 in 2 hours. Bonnet states that the approximate amount of essential oil in liquors of the anisette type may be determined by multiplying the iodine value by 1.515, or, in the case of liquors of the chartreuse type, by 1.498.—Ann. Fabrif.; through Chem. and Drug., 88 (1916), 1034. (K. S. B.)

Volatile Oils.—Schimmel's Reports, April to October, 1916, as usual contain a large number of scientific and commercial facts concerning oils. Among others, the use of anise oil as remedy against mange is recommended using an ointment of oil of anise 1 Gm. with enough petrolatum to make 100.

The frequent presence of lead in oil of cassia is said to be due to the free cinnamic acid formed from the easily oxidizable cinnamic aldehyde. Only rectified oil should be used for food or medicinal purposes. Laboratory experiments prove that lead may be readily removed by shaking oil with tartaric acid (about 1. Gm. to 100 Gm. of oil).

A sophisticated sample of balsam of Peru that responded to all the requirements of the German Pharmacopœia was detected by the solubility of the balsam in alcohol in various proportions, whereas the pure balsam forms a clear solution only with equal parts of 90 per cent. alcohol.

The Bulgarian yield of oil of rose was decreased by unfavorable weather. The average yield obtained was about 1 Kgm. from 3,500 Kgm. of flowers; total yield of oil obtained in 1916 about 2800 Kgm. —D.-A. Apoth. Ztg., 37 (1916), 129. (J. H.)

Japanese Essential Oils.—*Characteristics and Constituents.*—The following details concerning various Japanese essential oils have been published due to investigations by S. Uchida and his coworkers. The leaves and wood of the valuable Hinoki timber tree *Chamæcyparis obtusa* yield a volatile oil, as does also the wood upon dry distillation. The latter oil, when rectified, has sp. gr. 0.8821 and opt. rot. —50.6°. It contains much pinene and is recommended as a substitute for turpentine. The berries of *Xanthoxylum piperitum*, a wild shrub, yield about 5.7 per cent. of a volatile oil (Sansho oil) which commences to boil, under ordinary pressure, at 110° C., the boiling point of the last fraction being 239° C. About 80 per cent. distils 176°–186° C., has a sp. gr. 0.8504, opt. rot. +46.5°, ref. ind. 1.46, acid value 3.3 and ester value 19.3. It consists of free fatty acids (mostly palmitic) 2 per cent., aldehydes 15 per cent., esters 5.7 per cent., free alcohols 1.1 per cent. and terpenes, chiefly dipentene, 77 per cent. The oil has a pleasant odor, and is recommended for use in perfumery. The green leaves of the coniferous tree *Cryptomeria japonica* yield about 0.7 per cent. of a volatile oil (Sugi oil) which distils 155°–350° C., has a sp. gr. 0.922, opt. rot. 19.3°, ref. ind. 1.4895, acid value 1 and ester value 6.6. It contains a trace of free acetic acid, 3 per cent.

of free alcohol of the formula $C_{10}H_{18}O$, 3.3 per cent. of the caprylic ester of this alcohol, 34 per cent. of terpenes, chiefly pinene, 30 per cent. of sesquiterpenes, 12 per cent. of a sesquiterpene alcohol and 18 per cent. of a diterpene.—Chem. and Drug., 88 (1916), 476. (K. S. B.)

Synthetic Perfumes.—*Manufacture.*—Prof. Justin Dupont classifies synthetic perfumes, by origin, as follows:

1. By-products of the distillation of coal, comprising derivatives of benzol, toluol, metazylol, naphthalene and the cresols. To this class belong vanillin, coumarin, artificial musks, benzaldehyde, anisaldehyde and benzylacetate.

2. Principles derived from the essential oils of plants:

Oil of Turpentine (Landes) = camphor, terpineol.
Oil of Lemongrass (India, Tonkin) = ionone, methyl-ionone.
Oil of Citronella (Java) = geraniol and citronellal.
Oil of Citronella (Ceylon) = geraniol.
Oil of Geranium (Algeria, Bourbon) = rhodinol.
Oil of Palma Rosa (India) = geraniol.
Oil of Camphor (Japan) = safrol and heliotropine.
Oil of Anise (China, Tonkin) = anisol.
Oil of Clove (Zanzibar) = eugenol and vanillin.
Oil of Storax (Isle of Rhodes) = cinnamic alcohol.
Oil of Rosewood (Cayenne)
Oil of Linaloe (Mexico) } = linalol.
Oil of Shiu (Japan)

Benzaldehyde is a primary substance in the manufacture of dyes. Chlorine and acetic acids are used extensively in this industry and are manufactured cheapest in Germany.—Sc. Am., 1916, No. 2103. (O. R.)

Azulene.—*The Blue Hydrocarbon of Volatile Oils.*—Trier discusses the blue hydrocarbon obtained from volatile oils by Sherndal (See Year Book 1915, 251). The best known example of a blue oil is that from matricaria; oil of cubebs and oil of vermouth are also blue or blue-green before distillation. Reunion geranium oil is usually green, while camphor oil yields blue fractions at times. The blue compound also appears in the oil of Canada snakeroot, in the ethereal oil of achillea, and in oil of valerian root. The blue or green portion is always found in the fraction boiling between 275 and 300 degrees. Certain indications exist which point to an oxidation product of the sesquiterpenes. Similar blue compounds can be prepared by oxidizing sesquiterpenes artificially.

Wislicenus found that a blue compound could be formed by the dry distillation of calcium adipinate. Gurjunene yields a blue oil when heated in an autoclave. The oil of gurjun balsam, heated with steam, gives a deep blue distillate.—Schweiz. Apoth. Ztg.; through Pharm. Era, 49 (1916), 193.

Phellandrene.—*Nitrosochloride of.*—The essential oil of Bupleurum fruticosum yields a nitrosochloride which is almost constant in rotation irrespective of the fraction from which it is obtained, say Francesconi and Servagiotto. The yield is inversely proportional to the change in the specific rotation of the fraction of the oil employed. Since alpha-phellandrene does not yield a nitrosochloride under the experimental conditions employed by the authors, it is practically certain that almost pure beta-phellandrene is the variety. The specific rotation, namely, between +14° 30′ and +19°, is therefore confirmed for this terpene nitrosochloride. In the higher rotating fractions of the oil alpha-phellandrene is present in considerable quantity. The specific rotation of pure beta-phellandrene is given as about +65°.—Chem. and Drug., 88 (1916), 737. (K. S. B.)

Oil of Brisbane Sassafras.—*Constituents.*—Investigation of the essential oil of the bark and leaves of Cinnamomum Oliveri, commonly called the Brisbane sassafras, by G. W. Hargreaves showed the bark oil to consist of pinene 12 to 15 per cent., camphor 18 to 20 per cent., eugenyl methyl ether 40 to 45 per cent., and an unstated quantity of safrol. The oil from the leaves contained about 25 per cent. of a mixture of pinene, and a second terpene, probably phellandrene, about 60 per cent. of dextro-camphor and 15 per cent. of a mixture of phenols and unidentified substances. Finding no terpene of low boiling point he concludes that Smith was mistaken in his suspicions of the presence of cineol, eugenol, and cinnamic aldehyde.—Jour. Chem. Soc.; through Chem. and Drug., 88 (1916), 973. (K. S. B.)

Oil of Cade.—*Properties.*—According to Huerre when Juniperus oxycedrus is distilled with steam, from 1.6 to 3.1 per cent. of a volatile oil is obtained, the yield varying with the seasons. The oil, which does not possess the disagreeable odor of the oil obtained by destructive distillation of the wood, was found to be just as effective in dermatosis as the latter. It is of a dark yellow color,

is rather viscous; its specific gravity is 0.925; optical rotation —31.42°; and boiling point 260 to 300°, 70 per cent. distilling between 260 and 280°.—J. pharm. chim.; through Drug. Circ., 60 (1916), 20.

Camphor.—*Test for Natural.*—Bohrisch says that if 0.1 gramme of powdered natural camphor is mixed on a watch-glass with 10 drops of a cooled mixture of equal parts of vanillin-hydrochloric acid and concentrated sulphuric acid and the watch-glass covered with another glass in order to prevent the hydrochloric acid vapors from escaping, the mixture after half an hour is colored distinctly pink; after two hours green; and after five hours dark blue. Synthetic camphor treated in the same manner is colored only yellow. —Pharm. Zentralhalle; through Drug. Circ., 60 (1916), 20.

Camphors.—*Pharmacology of.*—The question whether or not the levorotatory, the dextrorotatory or the inactive camphor are equally desirable and fit for medicinal use has frequently been raised and the results of numerous experiments seem to show that the synthetic, inactive camphor should not be used internally. G. Joachimoglu has again taken up this question and compared physiologically the official dextrorotatory camphor, the levorotatory or matricaria camphor and two samples of synthetic camphor made by two different firms and on the strength of his experiments he arrives at the conclusion that no difference exists between the three camphors in regard to their toxicity and that synthetic camphor is tolerated by the organism just as well as the official dextrogyrate product.—Arch. f. experim. Pathol. u. Pharmacol.; through Pharm. Weekblad, 53 (1916), 1515. (H. E.)

High-Boiling Camphor Oil.—*Constituents of.*—K. Kafuku finds that raw high-boiling Formosan camphor oil has a density of 0.9805 at 17.5°; refractive index, 1.5035 at 17.5°; ester value, 0.66; ester value after acetylization, 1.26; acid value, 3.14. Lauric acid, a compound, $C_{14}H_{26}O_2$ (m. p. 46°), and a sesquiterpene tricyclic alcohol were found.—J. Chem. Ind. Japan; through Chem. Abstracts, 10 (1916), 2960.

Oil of Chenopodium.—*Adulteration.*—Stheman reports having found a sample of oil of chenopodium which had been adulterated with oil of eucalyptus and oil of anise. The oil was not soluble in

9 parts of diluted alcohol and turned the plane of polarized light only 1° 8′ to the left.—Pharm. Weekblad; through Drug. Circ., 60 (1916), 273.

Oil of Calycanthus Occidentalis.—From spice bush, a plant growing in northern California or southern Oregon, named by botanists Calycanthus (or Butneria) occidentalis, C. C. Scalione obtained a greenish yellow volatile oil, the leaves yielding 0.15 per cent., the twigs about 0.37 per cent. This oil had a bitter taste and a camphoraceous odor. It had a specific gravity of 0.9295 at 25°; refractive index 1.4713 at 20°; optical rotation, +7° 28′; acid number, 0.05; ester number, 54.3; acetylization number 33.5. The oil was fractionated and from the fractions were obtained 8.3 per cent. of pinene (both dextrogyrate and levogyrate), 60.32 per cent. of cineol, 9.21 per cent. of borneol, 18.99 per cent. of linalyl acetate, as well as small amounts of camphor, methyl salicylate and sesquiterpenes.—J. Ind. Eng. Chem., 8 (1916), 729.

Citronella Oil.—*Properties of the Formosan Variety.*—K. Kafuku finds this oil closely resembles the Java citronella oil, having a density of 0.8868 at 17°; and an optical rotation of 24° 21′ in 10 centimeter tube. It is soluble in 90 per cent. alcohol in all proportions and contains 84.97 per cent. of total geraniol. The botanical origin of the oil is uncertain.—J. Chem. Ind. Japan.; through Chem. Abstracts, 10 (1916), 1908.

Oil of Cryptomeria Japonica.—*Antiseptic Action of.*—N. Yoshida states that for the preservation of the Japanese rice beer (Saké), it is customary to use barrels made from the wood of Cryptomeria japonica. Observations by Kimoto, Keimatzu and by Kimura have shown that the wood of this conifer contains a considerable amount of a volatile oil which, as Kimura shows, consists of two sesquiterpenes, cadinine and suginene and a sesquiterpene alcohol cryptomeriol. Yoshida has now found that this volatile oil, particularly the oxygen-containing fractions, which boil between 270° and 286°, has a distinct antiseptic value. From these observations it may be assumed that the recently made Cryptomeria-wood barrels contribute not only to the aroma of the Saké but also to its preservation.—J. Pharm. Soc. Japan; through Chem. Abstracts, 10 (1916), 2615.

Cymbopogon Oils.—Rosha grass or Cymbopogon martini exists in two forms, known to the natives as "motia" and "sofia." They differ morphologically only in respect of the disposition of the leaf

on the stem. The distribution of the two forms differs, but the chief difference lies between the characters of the essential oils they contain, motia grass yielding palmarosa oil, containing as much as 90 per cent. of free and combined geraniol, while the sofia form yields the so-called "ginger grass oil," containing only about half as much geraniol. According to R. S. Pearson, experimental cultivation of the two forms has been undertaken at Dehra Dun with a view to determining their botanical relationship.—Indian Forest Record; through Pharm. J., 97 (1916), 251.

Deodar Oil.—O. D. Roberts has examined a sample of the volatile oil from the wood of Cedrus deodara. The substances found were a ketone, $C_9H_{14}O$, probably methyl-Δ^3-*p*-tetra-hydroacetophenone, about 2 per cent.; a phenol (undetermined), from 0.07 to 0.4 per cent.; esters of hexoic, heptoic, and stearic acids, from 3 to 12 per cent.; sequiterpenes (consisting chiefly of a *d*-sesquiterpene of variable rotation), from 50 to 70 per cent.; besides sesquiterpene alcohols, which appeared to constitute the remainder of the oil, associated with high-boiling, viscous decomposition products.—J. Chem. Soc.; through Chem. and Drug., 88 (1916), 1183.

Elemol.—*A New Alcohol.*—Elemol is a new sesquiterpene alcohol ($C_{15}H_{26}O$) found by Semmler and Liao in the solid material separated from oil of Manila elemi. It can be purified by conversion to its benzoate and hydrolysis of this ester. It is apparently a monocyclic sesquiterpene alcohol, the first of its type to be found occurring naturally or prepared synthetically. The alcohol and its benzoate have the following characters:—

	Elemol.	Benzoic Ester.
Sp. gr.....	0.9411 at 20° C.	1.0287 at 20° C.
Ref. index.....	1.5030	1.5378
Rotation.....	—5°	—6°
Boiling point.....	152–156° (17 mm.)	214–218° (10 mm.)

Upon dehydration with acid sodium sulphate it yields the sesquiterpene elemene, a liquid of specific gravity 0.8797 and refractive index 1.4971.—Chem. and Drug., 88 (1916), 876. (K. S. B.)

Oil of Eucalyptus Australiana.—Baker and Smith consider that the narrow-leaved peppermint-tree, which has been regarded as a variety of Eucalyptus amygdalina, should be elevated to specific rank under the name Eucalyptus Australiana. It flourishes on the ranges of New South Wales and Victoria in a region of little agri-

cultural value, and yields a high amount of essential oil. The oil is poor in eucalyptol containing only about 45 per cent., but if the first fractions be collected, the eucalyptol concentrates in this portion, and a colorless oil, containing 70 per cent. eucalyptol and only traces of aldehydes, is obtained. The authors also claim to have discovered an alcohol of the formula $C_{10}H_{17}OH$ in the oil, but have not yet determined its characters.—Roy. Soc. N. S. Wales; through Chem. and Drug., 88 (1916), 946. (K. S. B.)

Oil of Eucalyptus Macaurthuri.—*Constituents of.*—J. C. Umney finds this oil remarkable for its high percentage of geranyl acetate (66.7 per cent.). It has the density of 0.926; α_D —2°, is soluble in 3 volumes of alcohol. It contains 76.3 per cent. total geraniol, some pinene but neither phellandrene nor eucalyptol.—Perf. Essent. Oil Record; through Chem. Abstracts, 10 (1916), 1403.

Oil of Euthamia Caroliniana.—*Properties and Constituents.*—The yellow flowers of Euthamia Caroliniana, which flourishes in the moist sandy soil of the eastern coast of the United States, especially in Florida, yield upon distillation about 0.7 per cent. of a pale yellow essential oil. According to G. A. Russell, this oil has a characteristic odor, specific gravity 0.8587, refractive index 1.4804 and specific rotation —10.8°. Dipentene is the principal constituent. Pinene and possibly traces of limonene are found. Free acids are absent, but traces of acids, probably formic and acetic, are found as esters. The total esters, calculated as geranyl acetate, are 2.1 per cent. The total alcohols, calculated as geraniol, are 7.01 per cent., 5.35 per cent. being free and 1.66 per cent. combined. Traces of an aldehyde and about 10 per cent. of an unnamed levogyrate body of high specific gravity are also present.—J. Am. Chem. Soc., 38 (1916), 1398. (K. S. B.)

Oil of Evodia Rutæcarpa.—*Constituents.*—The essential oil distilled from the fruit of Evodia rutæcarpa has been examined by Asahina and Kashiwaki. By fractional distillation under reduced pressure they obtained a terpene in a state of purity, which they believe to be different from any that have hitherto been isolated. It is a colorless liquid with a sharp odor. By treatment with platinum black, it yields dimethyl-octane, and is evidently an aliphatic terpene of the formula $C_{10}H_{16}$. It has been termed *evodene* by the authors. The following figures indicate its relationship to myrcene and ocimene:

	Myrcene.	Ocimene.	Evodene.
B. p. (20 mm.).....	67°	81°	67°
Sp. gr.....	0.8025	0.799	0.799
Ref. index.....	1.4673	1.4857	1.4843

Dihydro-myrcene is identical with dihydro-ocimene, and yields a tetrabromide melting at 88°. The corresponding compound of dihydro-evodene is liquid. The authors have also isolated from the fruit a crystalline substance, *evodiamine*, $C_{19}H_{17}N_3O$, melting at 278°. By heating this body with alcoholic potash it is resolved into a base of the formula $C_{11}H_{10}N_2$ and methyl-anthranilic acid.—J. Pharm. Soc. Japan; through Chem. and Drug., 88 (1916), 53. (K. S. B.)

Geranium Oils.—*Difference between Bourbon and Algerian Oils.*—J. C. Umney states that the chief distinguishing characteristics are density, percentage of esters, refractive index and ratio of citronellol to total alcohols.

These values are:

	Density.	Esters.	Refractive index.	Ratio of citronellol to total alcohol.
Bourbon..	0.888 to 0.896	29 to 38%	1.466 or lower	44:73
Algerian...	0.897 to 0.902	21 to 26%	1.470	33:74

—Perf. Essent. Oil Record; through Chem. Abstracts, 10 (1916), 2782.

Oil of Incense Cedar.—A. W. Schorger reports on an examination of the oil obtained from the leaves and twigs and from the bark of Libocedrus decurrens, a conifer growing in California. The yield of oil varies according to time of collection, from about 0.22 per cent. in June and October samples to about 0.28 per cent. in May and November samples. The borneol content of the oil is highest in August and September. The oil from leaves and twigs contains 12 to 16 per cent. of levogyrate alpha-pinene, 54 to 58 per cent. of other terpenes (sylvestrene, limonene and dipentene), 8 per cent. of bornyl acetate, 4 per cent. of free borneol, 6 to 7 per cent. of libocedrene, a sesquiterpene, obtained from the fraction distilling between 250° and 280°, 2 per cent. of a green oil and a trace of fural. The bark oil contains 75 to 85 per cent. of pinene, 5 to 6 per cent. of dipentene, 1 per cent. of bornyl acetate, 2 per cent. of free borneol, 3 per cent. of a green oil and a trace of fural. The green oil was obtained from the leaf-oil fraction distilling be-

tween 280° and 310° and from the bark oil 250°–290° fraction. It gave several characteristic color reactions.—J. Ind. Eng. Chem., 8 (1916), 24.

Oil of Lemon.—*Adulteration.*—A gross adulteration of oil of lemon is made known by Lauffs. The sample was found to contain about 50 per cent. of liquid paraffin and considerable quantities of oil of turpentine. It was sold for 7.95 M. per kilo, with the statement that the market price of this oil was continually advancing.—Z. öffent. Chem.; through C. U. C. P. Al. J., 23 (1916), 87. (G. C. D.)

Lemongrass Oil.—*Citral Content of.*—J. C. Umney has found that Bourbon lemongrass oil (density, 0.889; citral content, 78 per cent.) on standing in previously opened and previously unopened containers shows a diminution of citral content 60 and 68 per cent., respectively, the density at the same time increasing to 0.895 and 0.892, respectively. Cochin lemongrass oil showed a similar depreciation. To prevent deterioration, the oil should be thoroughly dried and stored in filled containers protected from light and air.—Perf. Essent. Oil Record; through Chem. Abstracts, 10 (1916), 2782.

Lemongrass Oil.—*Properties of the Formosan Variety.*—K. Kafuku finds this oil, which is sometimes called Hyang-Bow, is of a reddish brown color, has the density 0.8829 at 22°; the refractive index, 1.485 at 22.5°; the optical rotation from —0.1° to +0.1°; the acid value of 3.1; and the vicosity 3.1 at 18°. It is insoluble in 70 per cent., 80 per cent. and 90 per cent. alcohol; contains 64 per cent. of citral and yields a terpene fraction boiling at 39°; having a density of 0.8044 at 17.5°; and a refractive index of 1.4672 at 17.5°.—J. Chem. Ind. Japan; through Chem. Abstracts, 10 (1916), 1908.

Liquidambar Formosana.—*Volatile Oil from.*—K. Kafuku states that the leaves and twigs of the above-named plant yield about 0.05 per cent. of a pale green-yellow oil having a terpenic odor. It has the density 0.8655 at 20°; refractive index, 1.4755 at 20°; optical rotation, —3.3°; relative viscosity, 1.69 at 20°; acid number, 0; ester number, 5.9; ester number after acetylization, 25.2.

It consists of terpenes (camphene, α-pinene, di-pentene and possibly phellandrene and nopinene) and also traces of aldehydes or ketones.—J. Chem. Ind. Japan; through Chem. Abstracts, 10 (1916), 2386.

Oil of Mustard.—*Composition of Greek Variety.*—D. E. Tsakalotus states that Brassica nigra of Greece is capable of yielding a high grade of mustard oil. The assay of 5 samples of Greek mustard seed and 1 of ground mustard by the method of the Codex of 1908 gave from 1.13 to 1.21 per cent. allylthiocyanide; English mustard has 1.25 per cent. One sample of Greek origin, partly defatted by pressure, macerated with water for 24 hrs. and distilled by steam, gave a yellowish oil, boiling at 149° to 152°, having the density 1.019 and a refractive index of 1.537. It contained 99.4 per cent. of allylthiocyanide.—J. pharm. chim.; through Chem. Abstracts, 10 (1916), 1774.

Pinene Hydrochloride and Hydrobromide.—*Dextrogyrate Varieties of.*—Wallach, in his classic work "Terpene und Campher" (1914), pointed out that while levogyrate pinene yielded levogyrate hydrochloride and hydrobromide, those samples of dextrogyrate pinene that he had been able to obtain invariably yielded inactive hydrochloride and hydrobromide.

Tsakalotos and Papaconstantinu, finding that Grecian oil of Turpentine, consisted largely of dextrogyrate pinene, isolated a practically pure sample of pinene from this oil and prepared from it the hydrochloride and the hydrobromide. From the dextrogyrate hydrochloride, the authors prepared by the method suggested by Reuchler a dextrogyrate camphene of much higher rotary power than had been hitherto obtained. The optical rotation of these three new chemicals were: pinene hydrochloride, +33.19°; pinene hydrobromide, +31.31°; camphene, +84.05°.—J. pharm. chim., 14 (1916), 97.

Oil of Pine Needles.—*Swedish Industry.*—The manufacture of pine needle oil, extract and other products from Pinus sylvestris L. is an important industry. The largest plant, located at Jönköping, is the outgrowth of a very small beginning made by an apothecary 30 years ago. The raw material, namely the pine twigs and needles, is a by-product of the lumbering industry. A chopping machine cuts the twigs into very fine pieces which are then distilled with steam. The stills are large wooden retorts with a capacity of several thousand kilos of the raw material. The product, known as Swedish Pine Oil, is a thin clear liquid, colorless or with a slight green tinge, having the aromatic odor of Scotch pine needles. It is used as an antiseptic and deodorant in hospitals and sickrooms and for various medicinal purposes. The non-volatile extract which

remains in the stills is drawn off and refined into Pine Needle Extract or extractum pini sylvestris, which is used to prepare pine-baths. The spent needles are dried in the open air and are used for fuel in the plant.

Oleum pini pumilio is distilled from the twigs and needles of the Mountain Pine, which are collected during May or June. Pine Wool is a fibrous product obtained from large pine needles, from which the oil has been distilled, and which have been boiled in soda solution to remove the non-fibrous material. The pine produces about 400 pounds of needles which yield 0.57 per cent. of oil. The article is profusely illustrated and should be consulted for particulars —Sc. Am., January 22, 1916, 101. (O. R.)

Oil of Ravensara.—Ravensara aromatica is, according to Ferraud and Bonnafous, a member of the Lauraceæ family. It is found growing in abundance on the high plateaus of Madagascar. Distillation of the leaves and young branches yields an ethereal oil in abundance. This oil possesses a pleasant, aromatic odor, resembling that of camphor and eucalyptus. The greater part of the oil consists of a hydrocarbon, $C_{11}H_{20}$. It also contains an oxygenated portion, which, however, is only separated with difficulty from the hydrocarbon. The hydrocarbon portion of the oil is a colorless, clear and mobile liquid, specific gravity 0.8809, and boils at 171–172° C.—C. U. C. P. Al. J., 23 (1916), 187.

Oil of Rose.—*Production in Bulgaria.*—P. Martell gives an account of the cultivation, collection and distillation of the Damascus and white roses. One hectare (2.47 acres) yields 1400–2100 kilos of leaves, these yield 93–133 muskal (208 m. = 1 kilo) of oil. The importation into Bulgaria of geranium and other oils liable to be used as adulterants, is forbidden.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 10 (1916), 2614.

Oil of Sage Brush.—C. H. Jacobson states that two varieties of sage brush, Artemisia cana and Ramona stachyoides, have been found to contain considerable quantities of camphor and if a cheap method for its extraction could be devised might be of commercial value. Volatile oils, the nature of which is still undetermined, have been obtained from both Artemisia tridentata (common black sage) and Chrysothamus graviolens (rabbit brush) in considerable quantities.—Nevada Agr. Exp. Sta. Ann. Rept., 1916, 44; through Chem. Abstracts (1917).

Sandalwood Oil.—*Yield and Changes during Distillation.*—C. H. Briggs assayed 12 samples Mysore sandalwood for their oil content and found it ranged from 3.7 to 8.3 per cent. In carrying out the assays he found steam distillation did not produce a full yield of the oil from the wood so he obtained the oil by extracting the finely powdered sandalwood in a Soxhlet apparatus with ether, distilling off the ether on a steam-bath, mixing the residue with glycerin, distilling the glycerin and volatile oil *in vacuo*, adding water to the distillate and then shaking out the volatile oil with chloroform. Lastly the oil was freed from the chloroform by evaporation on a water-bath and in a vacuum desiccator. The addition of glycerin is necessary to insure the complete separation of the volatile oil from its admixture of fixed oil.

A study of the physical constants of the volatile oil thus obtained, showed it to be different from the oil obtained by steam distillation. Accordingly, in the next run of oil from 500 pounds of sandalwood by steam distillation, the constants of each day's run of oil were determined before the entire distillate was mixed. This showed that while the first day's run had a density of 0.969, a refractive index of 1.507 and an optical rotation of —12° 34′, the last (13th) day's run had a density of 0.982, a refractive index of 1.5046 and an optical activity of —6° 34′. To determine whether this change was due to the influence of the heated water vapor, a sample of oil having the optical rotation of —20° 40′ was boiled with water in a flask with reflux condenser, samples being taken out from time to time. After $3^1/_2$ weeks of such treatment, the optical rotation of the oil had been reduced to —13° 16′. Another sample of the same oil boiled with 10 per cent. sodium chloride under similar conditions had an optical rotation of —16° 40′.—J. Am. Pharm. Assoc., 5 (1916), 709.

Oil of Spike Lavender.—J. C. Umney has analyzed about 250 samples of this oil and as a result concludes that oils yielding over 35 per cent. of alcohols may be considered high quality, those containing 30 to 35 per cent. as of poor quality, and those containing less than 30 per cent. as adulterated.—Perf. Essent. Oil Record, 7 (1916), 239; through Chem. Abstracts (1917).

Thymol.—*Production from Horse-Mint.*—C. S. Hood obtained from the entire fresh herb of Monarda punctata gathered in Florida, 0.12 to 0.20 per cent. of volatile oil. This oil had a total phenol content ranging from 56 to 62 per cent. and most of this was thymol. Cultivated plants yielded as much as 0.44 per cent. of oil containing

72 per cent. of phenols, the highest phenol yield being from plants in the budded stage. Carvacrol was among the phenols present and the non-phenol portion of the oil consisted chiefly of cymene. Most of the thymol is found in the fraction of the oil passing over between 215° and 240°.—U. S. Dept. Agr. Bull.; through Chem. Abstracts, 10 (1916), 2960.

Oil of Turpentine.—*Detection of Camphor Oil in.*—For detecting camphor oil in turpentine oil the following reaction, depending on the identification of safrol which is present in the former, may be used according to Coen: One hundred mils of the oil under examination are distilled and the last 5 mils of the distillate are mixed drop by drop with 5 mils of concentrated sulphuric acid, cooling the mixture after each addition. Twenty mils of water are then added and the liquid is shaken out with 10 mils of amyl alcohol. The amyl alcohol layer is separated and mixed with 5 mils of a 20 per cent. potassium carbonate solution, when in the presence of safrol a green or bluish color will be produced, which changes to red on the addition of sulphuric acid.—J. pharm. chim.; through Drug. Circ., 60 (1916), 211.

Oil of Turpentine.—*Norwegian.*—Posse examined the essential oil obtained by heating the woody roots of the Norwegian pine and fir trees with sulphite liquor at a pressure of 6 to 8 atmospheres. The oil is a yellowish brown liquid, boiling at 157–160°, and having a specific gravity 0.8918 and optical rotation +7.8°. It contains terpenes, sesquiterpenes, resins, and sulphur compounds of the mercaptan series. Dextropinene and sylvestrene have been identified with certainty.—Ber. pharm. Ges.; through Pract. Drug., Aug., 1916, 39.

Oil of Turpentine.—*Substitutes.*—During shortage of turpentine in Germany, M. Böttler recommends the use of one of the following mixtures: (*a*) Pale rosin 100, refined rosin oil 60, lemon grass oil 1 to 1.5; (*b*) pale rosin 100, refined rosin oil 70, caraway or fennel oil 1 to 2. Apparently the rosin remaining after the distillation of the oil from turpentine is to be used.—Chem. and Drug., 88 (1916), Supplement XXXII. (K. S. B.)

Indian Turpentine Oil.—*Characteristics.*—The first volume of a sylviculture series of the "Indian Forest Records" deals with Pinus longifolia. The monograph has numerous illustrations and deals with the entire aspect of the tree and its possibilities. The

oil has a sp. gr. of 0.874, an optical rotation up to +2, a refractive index of 1.4740 and boils at 165° C. About 80 per cent. of the oil distils below 180° C.—Chem. and Drug., 88 (1916), 782. (K. S. B.)

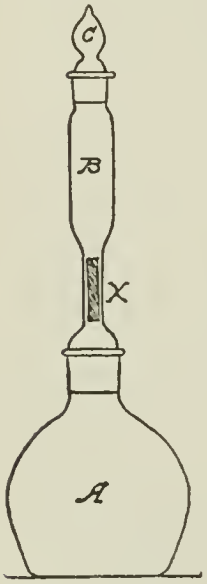
Zingiberol.—*A Sesquiterpene Alcohol in Oil of Ginger.*—B. T. Brooks has isolated from volatile oil of ginger a sesquiterpene alcohol having the formula $C_{15}H_{26}O$, boiling at 154 to 157° at 14.5 millimeters pressure. From 150 grammes of the oil, 24 grammes of the alcohol which he calls, *zingiberol*, were obtained. Volatile oil of ginger was found to contain, besides zingiberol, terpenes and sesquiterpenes, citral, methyl heptanone, nonyl aldehyde, linalool, dextrogyrate, borneol, esters of acetic and caprylic acids, a trace of a phenol (probably chavicol) and cineol.—J. Am. Chem. Soc., 38 (1916), 430.

ALCOHOLS AND DERIVATIVES.

Amyl Acetate.—*Use as Technical Solvent.*—T. H. Durrans discusses the large use now made of amyl acetate as a solvent for various types of nitrocelluloses. Its solutions are more viscous than those obtained with other solvents and when such solutions are too viscous, they may be thinned with benzene or gasoline. The article discusses the many uses now made of nitrocellulose lacquer in various branches of industry.—J. Chem. Tech.; through Chem. and Drug., 88 (1916), 181.

Ether.—*Determination of Water and Alcohol in.*—In a careful study of the subject, Mallinckrodt and Alt recommend the following methods: *Water Assay.*—In the bulb (*A*) of a 100-mil Regnault pyknometer 15 grammes of anhydrous potassium carbonate are placed and are accurately weighed after replacing the stem (*B*). Remove the stem, and quickly introduce into the bulb 50 mils of the ether under examination. Replace the stem and after 14 hours' standing, remove the stopper (*C*), invert the pyknometer and let the ether filter off from the carbonate through the cotton plug (*X*) forcing the liquid out of the bulb by warming with the hands. Fill (*B*) with absolute ether and by chilling the bulb (*A*) by pouring ether over it, the absolute ether will pass into the bulb and will wash the carbonate after which it can be expelled by warming the inverted bulb in the

Fig. 24.



Regnault Pyknometer.

hands. Wash the salt four times in this manner, being particularly careful to prevent any of the carbonate to escape through the cotton plug (*X*). Dry the flask at 50°, replacing the stem (*B*) by a drying tube filled with potassium carbonate, lastly sweep the remaining ether vapor from the flask by use of a current of dry air. Let stand in a desiccator, weigh, dry for a half hour and weigh, repeating until the weight is constant within 4 milligrammes. The increase in weight of the potassium carbonate is the amount of water in 50 mils of ether.

Alcohol Assay.—Dehydrate 100 mils of the sample with 40 grammes of anhydrous potassium carbonate, filter, determine the density of the filtrate at 25° C. and compare this with the graph given in the original article. This graph drawn after most painstaking density determinations made on samples of known alcohol content, shows that anhydrous ether has the density 0.70991 at 25; ether containing 1 per cent. of alcohol has the density 0.70197; containing 2 per cent. of alcohol, 0.71205; containing 3 per cent. of alcohol, 0.71303; containing 4 per cent. of alcohol, 0.71424.—J. Ind. Eng. Chem., 8 (1916), 807.

Ether.—*Dangerous.*—L. van Itallie and J. van de Zande, while examining an extract of cinchona which originally contained 4.8 to 4.9 per cent. of alkaloids, found only 2.7, 2.4 and 2.2 per cent., respectively. From an extract of belladonna examined according to the process given in the Dutch Pharmacopœia only 40 to 60 per cent. of atropine could be recovered. They found that these deficient results were due to a commercial non-redistilled ether which had been used for shaking out the alkaloids and also found that this ether contained an appreciable amount of peroxides. On distilling one liter of the ether, 46 mils boiled below 33°, 800 mils between 33 and 35°, 130 mils between 35 and 37° and 15 mils above 37°. The last fraction showed a strongly acid reaction to litmus and when heated to 55° exploded violently. When the main fraction of the ether (distilling between 33 and 35°) was used for assaying alkaloidal salts proper results were obtained.

The varying results obtained in assaying alkaloids were without doubt due to the length of time during which the alkaloid was in contact with the ether as could be shown by the following experiment: 3 portions of each 170 Mgm. of quinine were dissolved in 50 mils of the ether containing peroxide and were heated in a flask

provided with a reflux condenser for 15 minutes, 30 minutes and 45 minutes, respectively. The peroxide in the ether apparently oxidized the quinine, for when heated for 15 minutes only 20.8 per cent. of the quinine, when heated for 30 minutes only 17 per cent. and when heated for 40 minutes only 5.6 per cent. of the quinine could be recovered.—Pharm. Weekblad, 53 (1916), 1. (H. E.)

Ether Mixtures.—*Formaldehyde in.*—In mixtures of methyl and ethyl ether according to E. H. Embley formaldehyde is present, the amount increasing with the age of the sample. As the formaldehyde is a decomposition product of the methyl ether, the latter should never be used in anesthetic practice.—Med. J. of Australia, 1 (1916), 414; through Chem. Abstracts (1917).

Alcohol.—*Use as Vermin Killer.*—Dr. Charlier finds that bathing the body with alcohol is an effective means of destroying vermin. Cotton wadding saturated with alcohol and worn on the underclothing drives away fleas; while diluted alcohol used as a hair wash is very effective against lice.—Presse Médicale; through J. pharm. chim., 14 (1916), 371.

Alcohol.—*Mechanical Cleansing with Liquid Petrolatum.*—A few drops of liquid petrolatum shaken up with the alcohol in a bottle will carry down with the petrolatum all the impurities in the alcohol as it settles to the bottom. Or a drop or two of the petrolatum can be rolled around in a shallow tray of alcohol and then lifted out. The petrolatum can be seen taking up the impurities, like an enormous phagocyte, as it is rolled around.—Deut. Med. Wochschr.; through J. Am. Med. Assoc., 66 (1916), 154. (W. A. P.)

Alcohol.—*Dehydrated.*—Commercial "absolute" alcohol still contains about 1 per cent. of water. L. W. Winkler, Budapest, recommends the redistillation over metallic calcium. The commercial calcium in chips is put in a sieve and rotated, whereby the adhering calcium nitride, Ca_3N_2, passes through the sieve. In order to remove petroleum and the rest of the nitride, the calcium is then agitated with CCl_4 and lastly dried in a current of dry CO_2. About 20 Gm. of this prepared calcium are used for the distillation of 1 liter of alcohol. In order to remove traces of ammonia from this dehydrated alcohol, several centigrammes of alizarin are dissolved in each liter and 10 mils of this alcohol are used to

dissolve 0.5 Gm. of dried tartaric acid. Sufficient of the latter solution is added to the alcohol to change the red color to a light yellow. The last step is redistillation.—Z. angew. Chem., 21 (1916), 18. (O. R.)

Alcohol.—*Determination in Preparations by Distillation.*—A. B. Lyons points out that the official method of determining alcohol in pharmaceuticals, is to measure a definite volume of the fluid, dilute it with sufficient water, collect the same volume of distillate as of the original preparation taken and then determine its specific gravity. It is good practice to make all alcohol determinations at 60° F. However, if the liquid tested contains not more than 25 per cent. of alcohol and if the volume of original liquid and of distillate is identical, the operation may be performed at room temperature, the correction of the specific gravity reading to the 60° F. basis being calculated from the table given in the Pharmacopœia. If, however, the liquid to be tested contains from 25 to 50 per cent. alcohol, distillate representing twice the volume of the original liquid should be collected and if it contains over 50 per cent. a four-fold distillate should be collected. In such cases, measurement of the original liquid and of the distillate at room temperature will lead to erroneous results, since there is a marked variation in the coefficient of expansion of alcohol-water mixtures of different strengths, and the measurements must, therefore, be taken at 60° F.—J. Am. Pharm. Assoc., 5 (1916), 807.

Formaldehyde.—*Assay.*—Vanderkleed and E'we find that in the assay of solution of formaldehyde of U. S. P. VIII, the time directed for maceration of the solution with hydrogen dioxide and normal alkali (30 minutes) is insufficient to insure the complete oxidation of formaldehyde to formic acid. At least 1 to 2 hours' standing should be directed, the authors having found by experimentation that methyl alcohol, if present, is not oxidized by such treatment. Acetanilide, if present in the solution, consumes some alkali but the quantity is negligible.—J. Am. Pharm. Assoc., 5 (1916), 713.

Formaldehyde.—*Assay.*—A new method described by Herrmann is based on the old Legler principle, in which the formaldehyde is made to combine with a known amount of ammonia, producing the neutral hexamethylenetetramine, but avoids the use of a standard solution of ammonia, the latter being inaccurate and unstable. Instead, Hermann utilizes the power of sodium

hydroxide to liberate ammonia from ammonium salts. Into a closely stoppered flask of about 100 or 125 mils capacity are weighed about 4 mils of the formaldehyde solution. Three grammes of finely powdered ammonium chloride are added, followed by 25 mils of double-normal caustic soda, the latter being run in as rapidly as possible, and with vigorous shaking. The reaction generates considerable heat, and is practically instantaneous. After the solution has cooled, 50 mils of water are added, and the excess of soda titrated back with normal acid, using methyl orange as indicator. The number of mils of equivalent normal soda solution consumed, multiplied by 0.06, gives the grammes of formaldehyde in the sample used.—Chem.-Ztg.; through Pharm. Era, 49 (1916), 114.

Formaldehyde.—*Detection of Copper in.*—H. Kunz-Krause reports that copper contamination of formaldehyde occurs readily, if the gas has been prepared with aid of a copper spiral. Copper formate is produced by the action of formic acid, produced by oxidation of the formaldehyde, on the copper spiral. The presence of copper in formaldehyde may be readily detected by noting the blue-green coloration produced when a few drops of pyridine are added. If copper is present it can be renovated by treatment with pieces of bright iron. If the aldehyde has an acid reaction it must first be shaken with calcium carbonate and subsequently filtered.—Apoth. Ztg.; through C. U. C. P. Al. J., 23 (1916), 219. (G. C. D.)

Formaldehyde.—*Disinfection of Clothing with Formaldehyde-Permanganate Mixture.*—F. Gaud describes the apparatus used to disinfect clothing in the war zone. It consists of a cask fitted to the formaldehyde generator.—J. pharm. chim., 13 (1916), 262.

Formaldehyde-Permanganate Disinfection.—J. R. Hill publishes a critique of the Johnson-McClintick method of disinfection wherein formaldehyde gas is generated by mixing the solution with potassium permanganate. He points out that in the proportions directed at least 20 per cent. of the formaldehyde in the solution is rendered useless for disinfection by being converted into formic acid and he claims that the actual loss of formaldehyde is much greater than the figure just given. Moreover, at the present time the cost of permanganate makes the process prohibitive. He believes that vaporization of formaldehyde solution is a more practical method of disinfection.—Pharm. J., 97 (1916), 590.

Formaldehyde.—*New Method of Disinfection with.*—A process which has been patented by the Schweizerisches Serum und Impfinstitut, consists of the following: 300 grammes each of anhydrous copper sulphate, potassium chlorate, in fine powder, and pulverized iron are placed in a suitable container, and covered with one liter each of water and formalin. The action of the water upon the copper sulphate, resulting in its hydration, generates sufficient heat to decompose the potassium chlorate, and the added heat thus produced is sufficient to vaporize the formalin. The liberated oxygen combines with the iron. Manganese dioxide may be added to the other substances.—C. U. C. P. Al. J., 23 (1916), 219. (G. C. D.)

Formaldehyde.—*Use in Pruritis Ani.*—According to J. Cropper, a starch jelly containing from 1 to 2 per cent. of solution of formaldehyde is a valuable remedy for pruritis ani. It is preferable to greasy ointments and gives better results than does treatment with iodine.—Brit. Med. J.; through Am. J. Pharm., 88 (1916), 573.

Formaldehyde Vapors.—*Removal of.*—A. Scholtz, of Hamburg, has patented a process having for its object the rapid removal of noxious vapors after disinfection of rooms with formaldehyde, or by means of "salforkose," a preparation containing formaldehyde and carbon disulphide. The process is essentially as follows: A mixture of ammonia and menthone or an essential oil containing menthone, such as dementholized Japanese oil of peppermint, is vaporized within the room which has been subject to the disinfection. It is claimed that the room can be used sooner than if ammonia alone be employed.—C. U. C. P. Al. J., 23 (1916), 251. (G. C. D.)

Aldehydes.—*New Reaction.*—R. de Fazi states that the following test is capable of detecting very small quantities of aldehydes. When a few drops of a chloroform solution of an aromatic aldehyde are treated with two or three drops of a 1 per cent. chloroform solution of acenaphthene, slowly adding 1 mil. of strong sulphuric acid, a green ring, changing to reddish violet, is obtained. If the tube is shaken, the sulphuric acid is colored first green and then reddish violet, the latter color persisting for several days. The test affords means to distinguish between aromatic and aliphatic aldehydes, the latter not giving the colorations. Formaldehyde, for example, gives a black precipitate which is insoluble in most organic solvents, while acetaldehyde yields a similar condensation product. The colorations (green changing to violet)

are also obtained with aldoses and with carbohydrates capable of forming furfural or aromatic aldehydes on treatment with cold sulphuric acid. In the case of lactose, for example, an intense green coloration is produced in a few minutes, and this changes to violet after about forty minutes. Maltose reacts much more slowly than dextrose or lactose.—Gazz. chim. ital.; through Pharm. J., 97 (1916), 215.

Wood Alcohol.—*The Danger of.*—F. J. Wulling, in a paper read before the Minnesota Pharmaceutical Association, expresses the opinion that while the pharmacist is very careful to comply with the label requirements he ought also to make sure that the purchaser of a poison is acquainted with the proper use of such poison. He cites a number of accidents, some resulting in death, due to ignorance in the use of wood alcohol. The widest publicity ought to be given to the poisonous properties of wood alcohol and the pharmacist should take active part in this work.—Drug. Circ., 60 (1916), 206. (H. H. S.)

Methyl Alcohol.—*Detection.*—Pazienti applies Schryver's reagent for detecting methyl alcohol in ethyl alcohol. Five mils of the sample are diluted with 50 mils of water, the mixture transferred to a flask containing 3 grammes of sodium persulphate and 10 mils of concentrated sulphuric acid and distilled. Fractions of each 2 mils are then collected and to the fifth fraction 8 drops of a freshly prepared, filtered one per cent. phenylhydrazine hydrochloride solution, 4 drops of a five per cent. potassium ferricyanide solution and 1 mil of concentrated hydrochloric acid are added. If methyl alcohol is present a pink color will be produced in the mixture.—Boll. chim. farm.; through Drug. Circ., 60 (1916), 339.

Glycerin.—*Antiseptic Value.*—Glycerin has recently been proved to be a most admirable sterilizing agent, particularly suited for rendering surgical instruments absolutely aseptic. Tests have been made with the bacilli of tuberculosis. When heated in glycerin at a temperature of 120° C., these germs are invariably killed at the end of one minute. The germs that are killed in this way are those of diphtheria, anthrax, and chicken cholera as well as Bacillus coli, B. paratyphosus, B. pyocyaneus, B. subtilis, Staphylococcus albus, and Streptococcus brevis. Surgical instruments are uninjured by the treatment, while rubber tubes remain not only un-

injured, but are even restored to elasticity when they have become somewhat brittle.—Dental Digest; through Pharm. J., 97 (1916), 505.

Glycerin.—*Substitutes for.*—A. Langer states that the substitutes for glycerin found in German commerce are solutions of slimy substances possessing considerable viscosity but low density. Those having the density of 1.45 or less are strong solutions of organic potassium salts, one such sample containing ethylidene lactic acid. Others contain calcium sucrate.—Apoth. Ztg., 31 (1916), 342; through Chem. Abstracts (1917).

Glycerin Substitutes.—In Germany, five types of glycerin substitutes are used: (1) Gum, glue, and viscous substances; (2) sugar solutions; (3) mixtures that contain fixed oils; (4) salt solutions; and (5) mixtures of substances resembling these. Among those sold are:

Group 1.—Lempellin, a decoction of carragheen, preserved with borax and formaldehyde. Algin, an infusion of laminaria with a soda solution. Novoglycin, a solution of glue in water. Glycerit, quince mucilage with 10 per cent. of glycerin and a little borax. Mention is also made of preparations of agar-agar, fish-glue, Iceland moss, linseed, marshmallow-root, salep and tragacanth. An objection to all substitutes of this group is that they require preservatives for keeping them.

Group 2.—Glycerin substitute (Henkel), two sorts, both containing about 60 per cent. of sugar.

Group 3.—Proglycerin, a liquid lanolin emulsion. Paraffin is also recommended.

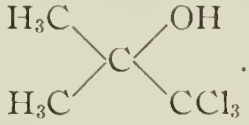
Group 4.—A solution of calcium chloride, 36 per cent., is recommended for some medicinal purposes. Perglycerin contains 45 to 70 per cent. of sodium lactate in solution, and perkaglycerin 60 to 80 per cent. of potassium lactate.

Group 5.—Solutions of glucose mixed with magnesium chloride. —Chem. and Drug., 88 (1916), 990.

Glycerin.—*Use for Boils.*—M. Bonnet recommends glycerin dressings for boils. After well disinfecting the skin with alcohol and ether, a sterilized swab was thoroughly soaked with glycerin and placed over the boil. It was kept in place by a turn of fine elastic bandage, not applied too tightly. In about twelve hours, the edema got less, and the local redness of the skin became limited directly round the spot at which the core formed very quickly.

The swelling of the boil was decidedly decreased, and with this the pain subsided. The boil suppurated in the usual way. The dressing was changed each day, and very gentle pressure was made at the time of dressing, taking care neither to cause hemorrhage nor to give pain. Healing definitely began towards the third day, after suppuration had begun. Excellent results, in a large number of cases, were obtained.—J. des. Practiciéns; through Pharm. J., 97 (1916), 7.

Tertiary Trichlorbutyl Alcohol.—*Pharmacology of the Esters of.*—The pharmacologic utilization of phenols is frequently accomplished by covering the hydroxyls by the introduction of acyl groups as in the case of salol. Such combinations pass through the stomach without decomposition and are broken down in the alkaline-reacting intestines. In this manner the irritating action of the phenols is overcome and a lasting and uniform effect made possible.

To test the question whether an analogous result occurs with alcohol esters, R. Wolffenstein, A. Loewy and M. Bashistez used trichlorbutyl alcohol,  . This alcohol is a decided hypnotic and, therefore, serves as an excellent physiologic indicator to determine whether and to what extent the properties of the alcohol are still present in the esters prepared therefrom.

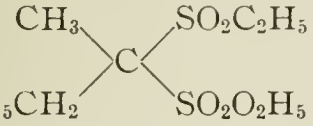
Numerous esters of the trichlorbutyl alcohol were prepared. The physiological experiments showed that in general they were not decomposed in the organism. The compounds made showed a special and often unexpected effect, frequently differing widely from that of the components.—Ber.; through Apoth. Ztg., 31 (1916), 6. (J. H. W.)

AROMATIC DERIVATIVES.

Baptisol.—E. D. Clark has obtained from the leaves of Baptisia tinctoria, a new phenol having the formula $C_{14}H_6O(OCH_3)(OH)_3$, melting at 212-213°. This substance is obtained from the dry and blackened leaves by extraction with boiling diluted alkaline solution and by precipitation from this solution with acetic acid. The fresh leaves do not yield the phenol.—J. Biolog.; through J. pharm. chim., 13 (1916), 192.

Benzylmethyl ketone.—*Preparation and Derivatives.*—Ogata and Ito have modified Beck's method of preparing benzylmethyl ketone,

by treating the nitrile of acetobenzyl with concentrated sulphuric acid and then boiling the resulting alpha-phenylacetoacetamide with 15 per cent. sulphuric acid. From the benzylmethyl ketone thus obtained, the authors prepared phenyl-sulphonal,



, by condensing the ketone with ethyl mercaptane and then oxidizing the resultant mercaptol with permanganate.

Phenyl-sulphonal occurs in colorless prismatic crystals, melting at 125.5° C., difficultly soluble in cold alcohol and almost insoluble in cold water.—J. Pharm. Soc. Japan; through J. pharm. chim., 14 (1916), 148.

Benzyl Benzoate.—*Increasing Yield of Claisen Method.*—The yield of benzyl benzoate may be increased by using dry, freshly distilled alcohol and aldehyde, says the Earl of Berkeley. Under these conditions 24 hours on a water-bath are sufficient, instead of several days, to insure the completion of the reaction.—Chem. and Drug., 88 (1916), 876. (K. S. B.)

Betanaphthol.—*Use in Ankylostomiasis.*—It is reported that betanaphthol tablets are being successfully used in treating hookworm.—Chem. and Drug., 88 (1916), 37. (K. S. B.)

Betanaphthol.—*Distinction from Alphanaphthol.*—G. Denigès uses the sulphotitanic reagent (1 per cent. solution of titanic acid in sulphuric acid) to differentiate between the two naphthols. A few particles, shaken in a test-tube with 2 or 3 mils of the reagent, afford an intense green color in the case of α-naphthol, and a blood-red tint with β-naphthol. If the substance is first dissolved in glacial acetic acid, and the sulphotitanic reagent is added to the solution, a green ring surmounted by a reddish violet zone distinguishes α-naphthol; while a blood-red ring indicates β-naphthol. —Ann. chim. anal.; through Pharm. J., 97 (1916), 523.

Citrophen.—*Detection.*—When a solution of citrophen is mixed with a solution of potassium dichromate a beautiful violet color is produced. This reaction may be utilized for identifying citrophen, according to Broeksmit. Pyramidon gives a similar reaction, but citrophen is identified in the presence of this antipyretic, but in the absence of phenacetine, by heating the mixture with sulphuric acid and sodium salicylate by which salicylic acid ethyl ester, recognizable by its odor, is formed. Phenacetine naturally gives this

reaction also, but not the potassium dichromate reaction. When citrophen, pyramidon and phenacetine are present together, the mixture is shaken with water, filtered, the filtrate neutralized with ammonia water, acidulated again with acetic acid and shaken with an excess of barium carbonate or calcium carbonate. On now filtering and adding to the filtrate a drop of potassium dichromate solution a reddish brown color will be produced when citrophen is present.—Pharm. Weekblad; through Drug. Circ., 60 (1916), 275.

Cresols and Mercury Oxycyanide.—*Disinfecting Action of.*—A. J. Steenhauer has examined the disinfecting power of ortho-, meta-, and para-cresol and has compared the results with those obtained with mercury oxycyanide. The products were allowed to act for 24 hours on cultures of sporogenous Bacillus mesentericus and from the non-sporogenous Bacterium pyocyaneum. The different cresols were converted into liquor cresolis compound by the addition of 50 per cent. soap solution and a dilution of this preparation was utilized for determining the bactericidal power. It was found that meta-cresol has the strongest disinfecting power and is more active in a 5 per cent. solution than in a 50 per cent. solution. Para-cresol is less active and ortho-cresol was found to be the weakest of the three.

Mercury oxycyanide which was prepared according to the method of Rupp and Goy is in a solution of 1 : 1000 slightly weaker than a 5 per cent. meta-cresol solution.—Pharm. Weekblad, 53 (1916), 680. (H. E.)

Cresol Compounds.— *Value as Antiseptics.*—Schuelke and Mayr and Flemming call attention to the high disinfecting value of bodies consisting of mixtures of chlor-cresols, or their complex alkali salts, with chlor-xylenes. The chlor-cresols possessing the highest values are chlor-*o*-cresol (m. p. 48–49° C.) and chlor-*m*-cresol (m. p. 60° C.). The chlor-xylenes correspond to the following formulas: $C_6H_2(CH_3)(CH_3)(CH_3)(Cl)$ (1, 3, 4, 5, or 1, 3, 5, 2). Solutions of these mixtures may be made with the aid of soaps. Alcoholic solutions or solutions made with the aid of alcoholic solutions of alkalies are also employed. The chlor-xylenes are obtained by action of chlorine or sulfuryl chloride upon xylols.—C. U. C. P. Al. J., 23 (1916), 167. (G. C. D.)

Gas Works Pitch.—*Cause of Cancer.*—Certain substances, termed "auxetics," are necessary for cell-division, and others, termed "kinetics," increase cellular movements. Some of the latter, called "augmentors," increase the activity of auxetics. The fact that gas works pitch and tar, workers with which are liable to attack by cancer, contain both auxetics and augmentors, while blast furnace pitch, which does not predispose to cancer, contains only traces of auxetics and no augmentors, would indicate that these substances may play an important part in the production of cancer.—Chem. and Drug., 88 (1916), 49. (K. S. B.)

Metol Poisoning.—*Causes and Treatment.*—A number of methods of dealing with metol poisoning, which so frequently occurs in photographic working, are described. One writer ascribes the predisposing causes to prolonged soaking in the developer; excessive use of alkaline or mercurial solutions; the abuse of stimulants, which dilate the blood vessels of the skin and irritate the nerve-endings. He advises at the commencement of an attack (the characteristic itching) soaking the hand in warm water for five minutes, carefully drying, and rubbing with lanolin. Dry skin should not be scratched or peeled off, but removed with pumice stone. Any fissures which may appear from cracking of the dry skin should be painted with collodion, dabbing it well down into the sore. After a first attack, the use of metol should be discontinued entirely. Another writer advises those affected by metol to give it up, and urges the use of preventives, the best being a saturated solution of paraffin in gasoline. For the less severe forms of the affection, a soothing carbolic lotion is advised. For the chronic form, the following salve is advised: Salicylic acid 15 grs.; boric acid 60 grs.; starch 120 grs.; zinc oxide 60 grs.; petrolatum 1 oz. Many chronic cases heal nicely under flexible collodion alone, but one layer of this should always be removed with ether before again painting the part. One writer recommends as an effective remedy for metol skin poisoning a mixture of equal parts of glycerin and spirit of camphor, to each ounce of which 10 drops of phenol are added, to be well rubbed into the skin immediately after using the chemical. A certain worker was in the habit of using two metol hydroquinone formulæ, one of which did not affect the skin. Almost the only difference between them was that one contained sodium carbonate, and the other potassium carbonate. The latter had no ill effects in use, even though the skin had become very sensitive. It would thus appear that though the trouble is always

attributed to metol, it by no means follows that metol alone is the prime cause, and possibly the collection and summation of sufficient evidence would show that the metol-soda combination is the real enemy. Acetic acid is recommended by some, the following recipe being given: Acetic acid, No. 8, 1 oz.; water, 2 oz.; sodium chloride, one tablespoonful. This is used four or five times daily for several minutes at a time, rubbing it well into the skin.—Brit. J. Photog.; through Pharm. J., 96 (1916), 597.

Nitrobenzene.—*Toxicity of.*—Schultz reports six cases of poisoning resulting from the application to the body of nitrobenzene solutions used by soldiers for body lice. One man barely escaped death.—Münch. med. Wochschr.; through Drug. Circ., 60 (1916), 483.

Phenol.—*Sodium Sulphate as Antidote.*—Sodium sulphate in strong solution is one of the best known antidotes for phenol poisoning. At one time it was erroneously thought that the antidotal effect was due to the formation of sodium phenolsulphonate. It has been suggested that whatever action sodium sulphate has as an antidote for phenol may be due to some hindrance to absorption, and possibly also to added purgation.—J. Am. Med. Assoc., 67 (1916), 535. (W. A. P.)

Phenol.—*Antidotes for.*—M. I. Wilbert discusses the value, or lack of value, of the various reagents proposed as antidotes to phenol poisoning. He points out that glycerin will not prevent the production of gangrene or the absorption of phenol. Wilbert points out that the other substances mentioned have been found inefficient as detoxicants for phenol, and in many instances distinctly harmful. He further notes that, while the value of alcohol as an antidote for phenol poisoning has been scientifically disproved, yet even as late as 1915, the fallacy that ethyl alcohol is an antidote to phenol has been embodied in state laws designed to restrict the sale of phenol. Recent investigation, carried out in the Hygienic Laboratory, shows that in the presence of water neither alcohol nor glycerin has any detoxicating effect on phenol.—J. Am. Med. Assoc., 67 (1916), 233. (W. A. P.)

Phenol.—*Assay of.*—After outlining the Landolt, Riegler, Koppeschaar, Sutton, Messinger and Nortmann, Schwalbe and the Schryver assays for phenol, J. W. Forbing states that the Koppeschaar method is the most practical one but that it has the objection, from the standpoint of retail pharmacy, that the volumetric

solution required is not readily manufactured. He, therefore, suggests the following modified method of Koppeschaar's assay: Prepare tenth-normal sodium hydroxide solution and to 7 mils of this add a slight excess of bromine. When the reaction (producing sodium bromate) is complete boil the solution to drive off excess of bromine and then add it to the phenol solution, diluted so as to contain about 0.1 gramme of absolute C_6H_5OH to each 10 mils. To the mixture, add 5 grammes of potassium bromide, cool, then add 5 mils of 5 per cent. potassium iodide solution, 5 mils of hydrochloric acid and titrate the liberated iodine with thiosulphate volumetric solution as in the regular Koppeschaar assay. Check experiments showed that the method gave about the same results as did the U. S. P. process.—J. Am. Pharm. Assoc., 5 (1916), 166.

Phenol.—*Distillation of.*—Helene Rordorf states that reddened phenol may be purified by redistillation from a 1.5 liter flask. The vapors are air-condensed by passing down a glass tube 1.5 meters long and connected above by means of a short tube about 12 Mm. wide. Crystallization of the distillate upon standing means a phenol containing more than 90 per cent. C_6H_5OH. When 90 per cent. phenol is distilled, water first comes over, followed in about 15 minutes by crystallizable C_6H_5OH.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 10 (1916), 2614.

Salvarsan Preparations.—*Toxicity of.*—Brandweiner's experience indicates that Salvarsannatrium is somewhat more toxic than neosalvarsan. Since the war began he has made fourteen thousand injections of salvarsan or its preparations and is guided by the reaction to the first injection, regarding the slightest trace of headache as a reaction worthy of attention to individualize treatment. A tendency to sleeplessness and extreme sensitiveness to noises are among the by-effects of salvarsan which he regards as significant. A toxic eruption after salvarsan calls for great caution. If any of the solution gets outside of the vein, the resulting pain can be relieved by a tourniquet, applying it for ten or twenty minutes at intervals of one or several hours as may be indicated.—Wien. klin. Wochschr.; through Pharm. J., 96 (1916), 327.

Salvarsan and Allied Compounds.—*Review.*—Noel C. Cassel contributes to the "Journal of Chemical Technology" an article on salvarsan and its allied compounds, dealing with the evolution of salvarsan and its relationship to atoxyl, arsacetin, etc.—Chem. and Drug., 88 (1916), 70. (K. S. B.)

Salvarsan and Neo-salvarsan.—*Excretion and Secretion.*—At a meeting of the Society of Public Analysts, John Webster reported analyses, showing the relative amounts of arsenic found in the various organs after injections of salvarsan and neo-salvarsan, special attention being drawn to the relatively very high proportion of arsenic present in the kidneys in one case in which post-mortem examination had shown that nephritis was present.

Various analyses of urine were given showing the variability of the rate of excretion.

Analyses of human milk from two cases of salvarsan treatment were referred to. These analyses showed that after a dose, or repeated doses, of salvarsan, the milk of a lactating woman is entirely, or almost entirely, free from arsenic (a minute trace of arsenic being found in one specimen only). Any beneficial results to the syphilitic child fed on such milk cannot be due to the presence of salvarsan or other compound of arsenic in the milk of the mother.—Chem. News, 113 (1916), 239.

Salvarsan and Other Arsenobenzene Compounds.—*Toxicity.*—J. Denysz discusses the causes of the injurious effects often observed after the injection of these bodies. He claims that the injurious effects often noted by the injection of bodies containing the arsenobenzene group, such as neo- and novo-salvarsan, are caused by the formation and deposition of a precipitate which occludes the capillaries. This was found to be especially true in case of the mono- and di-sodium salts of the arsenobenzene derivatives in presence of mineral salts, such as sodium chloride. This precipitation may be retarded or prevented in the presence of blood serum, sugars and glycerin. In case of prolonged treatment he recommends that only very dilute solutions be employed. He also recommends that the di-sodium salts be employed in place of the neutral products, claiming that these are more active and also safer. It is also pointed out that the appearance of distressing and unpleasant symptoms within 6 hours after an injection, caused by the formation of the afore-mentioned precipitate, is really an essential factor in the efficiency of these products in a therapeutical sense.—Comp. rend.; through C. U. C. P. Al. J., 23 (1916), 251. (G. C. D.)

Trichlorethylene.—*Toxicity.*—Plessner states that in consequence of the shortage of benzene, alcoholic, and other solvents, which have been used up for munition work, attempts have been made to employ other compounds to remove grease and similar

impurities in industrial processes. Trichlorethylene is one of the solvents which have been so used. This is found to cause smarting of the skin of the face and hands, followed by vomiting and other severe symptoms. All three branches of the trigeminal nerve were found to be completely anesthetized. There was no reflex from the cornea or from the mucous surfaces of the head. Loss of taste for sweet, acid, and salt, but not for bitter substances, was noted. In some other respects the action of trichlorethylene resembles that of chloroform. The toxic effect was probably due to contamination of the inspired air, and not to direct contact with the liquid. The elective action of the drug on the trigeminal nerve suggests the use of it in trigeminal neuralgia. The toxic symptoms were reminiscent of the paralysis of this nerve in tabes.—Berl. klin. Wochschr.; through Pharm. J., 97 (1916), 161.

Trinitrotoluene.—*Dermatitis from.*—R. P. White discusses the dermatitis caused by trinitrotoluene and ammonium nitrate. As treatment, a paint, prepared as follows, is dabbed freely on to the inflamed and itching parts: Camphor, 8; phenol, 6; mercuric chloride, 1; picric acid, 2; alcohol (90 per cent.), 180. The paint must not be used on irritable mucous surfaces. In the early pruriginous stage of such dust dermatitis it is said to be of the greatest value, and its repetition is requested by the patient. For home treatment, 2 ounces of the paint are mixed with 4 ounces of compound calamine lotion, with the addition of 30 grains of powdered gum acacia.—Lancet; through Pharm. J., 96 (1916), 401.

Vanillin.—*Determination.*—According to Sacher vanillin in alcoholic solution may be quantitatively determined by titration with N/10 sodium hydroxide, using phenolphthalein as indicator, the end-point of the reaction being very sharp.—Chem. Zeit.; through Chem. and Drug., 88 (1916), 613. (K. S. B.)

FIXED OILS AND FATS.

Fat.—*Estimation in Powders.*—S. P. Phillips gives a rapid method for estimating fat in powders by extracting with trichlorethylene and determining the fat in an aliquot portion of the solution. Details are given.—Chem. and Drug., 88 (1916), 68. (K. S. B.)

Fats.—*Identification.*—François gives the following method depending on the red color produced by acrolein in fuchsin-sulphurous acid solution. One gramme of solid fat or 30 drops of a liquid fat

are placed into a large test-tube and carefully mixed with 10 grammes of sand. A perforated stopper carrying a bent glass tube is placed in the mouth of the test-tube, and the bent glass tube arranged to dip in a vessel containing 3 mils of fuchsin-sulphurous acid solution, the end of the tube being about one centimeter below the surface of the solution. The large tube is then carefully heated in such a manner that the vapors come in contact with the fuchsin solution. When the distillation is finished the fuchsin solution is allowed to stand for five minutes, when in the presence of fat in the sample under examination a red color is developed in the liquid. The color changes to blue when the tube is placed in boiling water. The fuchsin solution, used in this test, is prepared by mixing 220 mils of a saturated sulphurous acid solution with 30 mils of a 0.1 per cent. aqueous fuchsin solution and 3 mils of concentrated sulphuric acid.—J. pharm. chim.; through Drug. Circ., 60 (1916), 275.

Fats.—*Test for Rancidity.*—G. Issoglio proposes a new method for the analysis of rancid fats. He uses the term "oxidizability number," by which he refers to the number of milligrammes of oxygen required to oxidize the organic compounds removed by the distillation of 100 grammes of a fat or oil in a current of steam. For fat and oils which are to be used as foods, this number was found to range between 3 and 10. Fats which had undergone decomposition yielded numbers which were much higher. The author states that in his opinion a number exceeding 15 would justify the rejection of the sample as a food. The "oxidizability number" is ascertained as follows: 20 to 25 grammes of the fat or oil to be examined, exactly weighed, and about 100 mils of distilled water are placed in a distilling flask with a long neck, and distilled in a current of steam, about 100 mils of distillate being collected in 10 minutes. Ten mils of the distillate, 50 mils of distilled water, 10 mils of 20 per cent. sulphuric acid, and 50 mils of N/100 potassium permanganate, V. S., are placed in a flask, fitted with a ground condenser, heated to boiling, and kept at the boiling temperature for 5 minutes. After the contents of the flask have cooled, 50 mils of N/100 oxalic acid, V. S., are added, and the contents then titrated with N/100 potassium permanganate, V. S. If X mils of the latter are used and the volume required for a blank test in which 10 mils of distilled water replace the fat or oil, is x, the oxidizability number will be found by the expression $80 (X - x)/P$, P being the weight of fat or oil taken.—Atti accad. sci. Torino; through C. U. C. P. Al. J., 23 (1916), 231. (G. C. D.)

Fats.—*Test for Rancidity.*—Vintilesco and Popesco apply the following reaction for estimating the rancidity of fats and oils: Ten grammes of the fat are heated at 35° until liquefied, mixed with 4 or 5 drops of diluted blood or of a 3 per cent. hemoglobin solution, 10 drops of freshly prepared tincture of guaiac and about 10 mils of water, and the mixture is shaken well for one minute. If the fat is rancid the emulsion which is formed by shaking is colored blue, the intensity of the color increasing with the increased degree of rancidity. In the case of only slightly rancid fats it is advisable to break up the emulsion by adding to the mixture an equal volume of alcohol in order to make the coloration more apparent. Attempts to replace guaiac by benzidine or guaiacol were not successful. The authors believe that the fats in becoming rancid absorb oxygen, which then can take the place of hydrogen dioxide, etc., in the peroxidase test for blood. Fats exposed to light and air gave a distinct positive reaction after 24 to 48 hours, while the odor of rancidity was not noticeable until after 4 to 5 days' exposure, and the acidity did not change until after 8 to 9 days.—J. pharm. chim.; through Drug. Circ., 60 (1916), 86.

Fixed Oils.—*Refining of.*—In an address before the Franklin Institute, Charles Baskerville discussed the various methods of freeing fixed oils from fatty acids and other impurities and described at some length his recently patented process, which consists in treating the oil with 2 per cent. of prepared cellulose, a suitable amount of caustic soda, and then, after basting and heating between 45 to 65°, dehydrating with a determined amount of exsiccated soda ash and then filtering off the oil. The solid residue can be freed of adhering fixed oil by hydraulic pressure, thus obtaining a yield of oil from 1 to 10 per cent. greater than is now secured. The process, according to the inventor, will take from one-tenth to one-third the time necessary in ordinary refining, it requires but little extra machinery, while the cost of the chemicals is no greater than by the processes now obtaining. The by-product cake can be used as a detergent even as the "foots" obtained by ordinary refining.—Chem. News, 114 (1916), 172 and 181.

Fixed Oils.—*Production from the Kernels of Stone-Fruits.*—K. Alpers reports that in Germany where fatty oils are extremely scarce at the present time a considerable quantity is obtained from stone-fruits by the following process. The stones are coarsely crushed and then thrown into a solution of calcium or magnesium

chloride of a specific gravity 1.15. The kernels having a specific gravity 1.05 will float on the surface while the endocarp having the specific gravity 1.18 will sink to the bottom. The kernels are removed, washed with water, dried and extracted with a suitable solvent.—Chem.-Ztg.; through Pharm. Weekblad, 53 (1916), 1618. (H. E.)

Fixed Oils.—*Sources.*—The yield of oil from seeds are: Rape, 40 per cent.; wild flax, 25 to 35; poppy, 47 to 50; linseed, 30 to 40; hemp, 30 to 35; black mustard, 33; white mustard, 25 to 35; European filbert, 50 to 60; white beech, 25 to 38; walnut, 40 to 50; red currant, 16 to 18; quince, 14 to 15; peach, 44; apricot, 39; plum, 31 to 42; cherry, 25 to 35; linden, up to 58; cucumber, up to 25; pumpkin, 34 to 38; sunflower, up to 30.—Apoth. Ztg.; through Drug. Circ., 60 (1916), 147.

Marine Animal Oils.—*Detection.*—The detection of marine animal oils in oils, fats and soaps was made the subject of study by J. Marcusson and H. von Huber, who report their findings as follows: The product "neutraline," which is prepared by subjecting marine animal oils to a high temperature, in absence of air, or in presence of an indifferent gas, or other similar products do not respond to the octobromide test. They, however, show positive results with the Tortelli and Jaffe color reaction test. They are also characterized by a high specific gravity, usually above 0.930, and a high degree of viscosity. Four samples examined showed from 31.7 to 40.5 Engler degrees, at 20° C. While it is true that other oils also possess a high specific gravity and viscosity, these can usually be identified by some special characteristics; thus, castor oil by its solubility in alcohol and its high acetyl value; soluble castor oil (blown castor oil), by showing presence of a considerable quantity of hydroxy acids, which are insoluble in petroleum benzine. Certain varnishes and like products obtained from linseed oil may readily be recognized by odor or by the phytosteryl acetate test. Hydrogenated marine animal oils may be identified by examination of the unsaponifiable matter for presence of octodecyl alcohol, m. p. 60° C. The constituent of marine animal oils to which the octobromide reaction is due, namely, clupanodonic acid, is also found, in small quantity, however, in some oils or terrestrial animal origin. In case of doubt, however, recourse may be had to a determination of the quantity

of this acid present, and also to the iodine value of the oil itself, or that of the separated fatty acids.—Mitt. kgl. Materialprufungsamt; through C. U. C. P. Al. J., 23 (1916), 250. (G. C. D.)

Vegetable Oils.—*Hydrolysis.*—W. F. Rudd presents the results of experiments relating to the hydrolysis of several vegetable oils. An outline of the methods followed is given, but the writer does not feel warranted in drawing any conclusions until a great many more experiments have been made. The author expects to continue his investigations in the hope of being able to issue some authoritative statement.—J. Am. Pharm. Assoc., 5 (1916), 170. (L. S.)

Vegetable Oils.—*New Color Reaction.*—Sixley and Frehse state that when 10 mils of most vegetable oils are mixed with 5 mils of a 20 per cent. sodium acetate solution and a few drops of a diazotized para-nitroaniline solution, a brown-red or raspberry color appears. Exceptions are olive oil and sunflower seed oil. The reaction is due to the presence of phenol-like substances in almost all vegetable oils. The reagent is prepared by dissolving 1.4 grammes of paranitroaniline in 10 mils of hot water and 2.8 mils of strong hydrochloric acid, allowing the mixture to cool to 10°, adding 8 mils of a 10 per cent. sodium nitrite solution and then sufficient water to obtain 100 mils.—Chem. Rev. Fett- Harz-Ind.; through Drug. Circ., 60 (1916), 275.

China Wood Oil.—*Examination of.*—According to Frank Browne the Hong Kong government has established the following specifications for South China Wood Oil: 1. Chinese wood oil shall be pale in color (according to season's production), merchantably free from foots, dirt and moisture. The total impurities shall not exceed 1 per cent., but unless otherwise provided from impurities not plainly adulterations up to 5 per cent. shall not justify rejection, but allowance shall be made by sellers for such impurities in excess of 1 per cent.

2. The refractive index of such oil shall not be less than 1.5204 at 15° C. Minus 0.0004 shall be considered the correction for each degree C. above 15 to 35° C., which should be applied to the refractive index when such is determined at temperatures between the points stated. (Year Book, 1912, 243, 1914, 489.)

3. The specific gravity at 15° C. shall not be less than 0.9400.

4. The oil shall satisfy the requirements of Worstall's, Bacon's, Browne's or Chapman's heat test.

The specifications are based upon the characters of a pure oil extracted in the government laboratory by pressure only. This pure oil had the following characteristics:

Specific gravity, 15/15°	0.9415
Iodine value	167
Saponification value	191
Heat test	12 minutes
Refractive index at 20° C	1.5206
Refractive index at 15° C	1.5226

In the examination of the oil the following points may be useful: When the gravity is determined at a temperature other than 15° C. it has been found that 0.00064 is the correction for 1° C. Thus a gravity of 0.9401 at 20°/15° C. is 0.9433 at 15°/15° C.

In the heat test the thermometric correction should be made according to the following formula:

$T + 0.00016 (T - t) N$, where T was the observed temperature, t the mean temperature of the emergent column, and N the number of scale degrees of the emergent column.—Chem. News, 114 (1916), 123. (J. A. K.)

Cottonseed Oil.—*Effect of Benzoyl Peroxide on Halphen's Reaction.*—Utz reports that Becchi's reaction is retarded and Halphen's reaction is rendered negative when applied to cottonseed oil which has been bleached with benzoyl peroxide.—Chem.-Ztg.; through Drug. Circ., 60 (1916), 211.

Croton Oil.—*Properties of Resin from.*—R. Boehm was able to separate from crotonolic acid a neutral portion, insoluble in petroleum ether, of very powerful action which on further purification yielded the colorless croton resin. (See Year Book, 1915, 301.) It was found to be enormously poisonous toward frog larvæ; the lethal dose for rabbits is 0.005 Gm. of a suspension in water prepared from an alcohol solution. The action of euphorbia resin was found decidedly less poisonous.—Arch. exp. Path. Pharm.; through Pharm. Ztg., 61 (1916), 116. (J. H. W.)

Croton Oil.—*Use by Malingerers.*—Comte discusses the ingenuity exercised by certain Continental troops to produce the appearance of fictitious morbid symptoms. In consequence, the military pharmacist has had to be constantly on guard to detect these serious frauds. Picric acid has frequently been used to simulate the symptoms of jaundice. It is now reported that croton oil has been employed to produce dermatitis. In many of these

cases a minute, partly empty tube, which has originally contained the oil, has been found on the patient. The nature of the contents may be identified as follows: The tube is rinsed out with a little alcohol and the solution floated on some strong caustic potash solution in a test-tube. This is then plunged in a boiling water-bath. In presence of croton oil, a reddish brown or violet ring of color is formed at the contact zone. No other oil tested by the author gives a similar reaction. Confirmation of the above reaction is obtained by rubbing a drop or two of the suspected oil, or of its alcoholic solution, on the forearm. In the course of a few hours a diffuse redness will appear on the part, then an eruption of a red rash which ultimately forms vesicles.—J. pharm. chim.; through Pharm. J., 97 (1916), 137.

Cuttlefish Liver Oil.—M. Tsujimoto describes the oil obtained as a by-product in the preparation of the so-called dried cuttlefish or calamary, known as Surumé in Japan, and esteemed as a delicacy in the Far East. More than 900 tons of this dietetic article are produced annually in Japan. It is estimated that one district alone produced 50 tons a year of the oil, and probably if the whole fish were used instead of only the parts rejected by the driers, the yield of oil would be materially increased. The livers and other internal organs of various species of cuttlefish, among others the calamaries of the genera Ommastrephus and Loligo, afford the material employed. The oil is extracted by simply boiling this with water. The yield is stated to be about 2 to 3 per cent. of the raw wet material. A specimen of the crude brownish red oil thus extracted had a very unpleasant odor and taste; when spread on the hand the odor was fishy. It solidified in a few hours on cooling with ice, and gave a dark brown color with a purple tinge with strong sulphuric acid. It had the sp. gr. 0.9316; acid value 3.88; saponification value 189.64; Wijs value 177.02; n_D 20° —1.4806; butyro refractometer index, 84.0 at 20°; unsaponifiable matter, 1.14 per cent.; glycerin, 10.24 per cent.; titre value 35–36° C. When exposed to the air calamary oil shows drying properties akin to sardine oil. When refined by partial saponification with caustic soda, a pale yellow oil free from marked unpleasant odor and taste is obtained. It is suggested that this purified oil may be useful as a substitute for cod liver oil when its medicinal properties have been determined. Although calamary oil has only lately been put upon the market, it is thought that,

in consequence of its low cost it will prove useful for many technical purposes.—J. Ind. Eng. Chem., 8 (1916), 801.

Fish Oils.—*Detection of.*—Gruen and Janks suggest the following modified Fortelli-Jaffe method: One mil of the water-free oil is dissolved in 6 mils of chloroform and 1 mil of glacial acetic acid and to the mixture 40 drops of a ten per cent. solution of bromine in chloroform are added. If fish oils are present a green color is produced. If a hardened oil is to be examined it is melted and 5 mils are mixed with 10 mils of chloroform, 1 mil of glacial acetic acid and then with 2.5 mils of the bromine solution.—Chem. Rev. Fett- Harz-Ind.; through Drug. Circ., 60 (1916), 145.

Kapok Oil.—*Detection.*—A. Besson reports on a method for the differentiation between cottonseed and kapok oils by means of the Milliau method, as follows:

A chloroformic solution of the oil is treated with a 2 per cent. solution of silver nitrate in absolute alcohol. Kapok oil at once assumes a deep coffee-brown color, while cottonseed oil assumes a much lighter brown color, and this only after a lapse of time. The quantity of oil employed and the quantity of the alcohol solution of silver nitrate added must be carefully controlled.

The same test applied to the fatty acids obtained from cottonseed and kapok oils, respectively, responds to this even more readily than do the oils, 0.10 per cent. of kapok oil being detected with certainty.—Chem.-Ztg.; through C. U. C. P. Al. J., 23 (1916), 12. (G. C. D.)

Lanolin.—*Substitutes for.*—In preparation for a possible lanolin shortage various formulæ have been suggested in the countries likely to be affected during the war. According to D. R. P. 124,874, Chinese wood oil is converted by short heating to 300° C. into a thick consistency. Three parts of this thickened oil are dissolved by warming in 7 parts liquid wood oil and 3 parts wax added. The product thus obtained is said to possess all the properties of genuine lanolin.

Of a number of formulæ by Dieterich published in Helfenberger Annalen, 1889, van der Wielen considers as best a mixture of 20 parts white wax and 80 parts of fresh unboiled linseed oil which is capable of absorbing as much as 170 parts of water. Van der Wielen also considers Hegland's formula of 20 parts linseed oil, 20 parts white vaseline and 5 parts cetaceum, with an absorptive power of 100 per cent. water, and Ten Velthuis' recipe of 10 parts

yellow wax, 25 parts lanolin, 45 parts Chesebrough's yellow vaseline and 25 parts water to be satisfactory. Another formula, without lanolin, is 15 parts yellow wax, 60 parts Chesebrough's yellow vaseline and 25 parts water.

V. Bruck recommends a preparation named Cerolanum prepared according to the following directions:

Cerolanum anhydricum.		Cerolanum.	
Cera flava (colat.)	7 parts	Cerolanum anhydric	70 parts
Adeps Lanæ	15 parts	Aqua dest	30 parts
Vaselinum (alb. americ.)	78 parts		

The melting should be conducted at very low heat.

E. Anselmier gives the following directions for "Kunstvaselin:"

Cera flav	0.3
Paraffin. sol	0.7
Vasel. flav	9.0

in which Chesebrough or Wilburine vaseline should be employed if possible.

The above formulæ are advocated in various countries which depended upon Germany for their supply of lanolin, in which latter country there is so far no scarcity of this article.—Pharm. Ztg., 61 (1916), 66. (J. H. W.)

Lanolin Substitutes.—C. Bührer describes cetosanum anhydricum consisting of 7 parts of cetyl alcohol, 10 parts of wool fat and 83 parts of white vaseline. The cetyl alcohol can be prepared by saponifying spermaceti with potassium hydroxide and separating the cetyl alcohol by adding sodium chloride.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 10 (1916), 1576.

Lard.—*Substitute for.*—To replace lard, which is now very scarce in Germany, Stier suggests a mixture made by melting 380 grammes of yellow petrolatum and adding to the molten mass 370 grammes of a 5 per cent. gelatin solution. After standing 2 or 3 days the mixture is of an ointment-like consistence.—Pharm. Ztg.; through Drug. Circ., 60 (1916), 401.

Lard.—*Substitute for.*—Koester suggests a mixture of 120 grammes of Japan wax, 210 grammes of petrolatum and 1000 grammes of liquid petrolatum. This mixture is fused and then stirred until cool. It may be used as a basis for zinc salve, ointment of potassium iodide and other salves.—Pharm. Ztg.; through Pharm. Zentralhalle, 57 (1916), 254.

Nux Vomica Fat.—*Constants for.*—Watt and Angus examined a sample of the fat of nux vomica seed and found that it was of a dark brown color and had a somewhat unpleasant odor. The following particulars are given: Sp. gr., 100°/15.5° —0.892; solidifying point, 60° C.; saponification value, 152; iodine value (Hübl), 54; Reichert-Wollny value, 1.0; acetyl value, 31.2; acid value, 33.7.—J. Soc. Chem. Ind.; through Pharm. J., 96 (1916), 273.

Peanut Oil.—Oleum Arachidis is of a higher grade than cotton-seed oil and of somewhat lower value than first-class olive oil. African peanuts yield about 50 per cent., Spanish peanuts about 35 per cent. of oil. The principle manufacture is in Marseilles, France.—Farmers' Bulletin; through Sc. Am. Suppl., 1916, No. 2103. (O. R.)

Peanut Oil.—*Detection of Arachidic Acid in.*—R. H. Kerr recommends the following method which he says is superior to the Renard method. The reagents required are: (1) Potassium hydroxide solution, 100 Gm. in 100 mils water. (2) Magnesium acetate solution, 10 Gm. of the salt in a mixture of 100 mils distilled water and 100 mils of 95 per cent. alcohol. (3) Acetic acid solution, 50 mils of glacial acetic acid with 150 mils of 95 per cent. ethyl alcohol. (4) Sulphuric acid solution, 50 mils of concentrated acid with 150 mils of distilled water. (5) 90 per cent. ethyl alcohol (by vol.). The method is: Weigh out 20 Gm. of the oil in a 300 mil Erlenmeyer flask, pour in 200 mils of 95 per cent. ethyl alcohol and heat to boiling on steam-bath; then add 10 mils of the KOH solution, and after saponification add a few drops of phenolphthalein and neutralize the excess alkali with the alcoholic solution of acetic acid. Next add 50 mils of the magnesium acetate solution and heat to boiling. Allow to cool to room temperature and leave until next day. Filter off the solution, wash the precipitate twice with 50 per cent. alcohol and thrice with distilled water and return to the flask. Pour 100 mils of hot distilled water into the flask and add sufficient dilute sulphuric acid to decompose the magnesium salts. Heat until the separated acids form a clear layer. Cool the flask, pour off the acid solution, add 100 mils of hot water. When the fatty acids have melted and solidified, pour off water as before. Free the cake of acid from water as far as possible by draining; dissolve in 100 mils of 90 per cent. alcohol

and separate the arachidic acid by crystallization. The results are qualitative only. The method has been found to be capable of detecting 5 per cent. of peanut oil in olive oil, cottonseed oil, soy bean oil, and corn oil.—J. Ind. Eng. Chem., 8 (1916), 904.

Shark Liver Oil.—*Hydrocarbon in.*—M. Tsujimoto calls attention to a highly unsaturated hydrocarbon present in shark liver oil. This hydrocarbon, named *squalene*, is found in some shark liver oils, and can be produced in Japan in commercial quantities, by distilling the oils which contain it, under reduced pressure, or with superheated steam, and treating the distillate with alkali to remove free fatty acids. The hydrocarbon is readily soluble in ether, acetone, petroleum ether and carbon tetrachloride. It is only sparingly soluble in alcohol and glacial acetic acid. When mixed with 1 per cent. of cobalt resinate, it produces, even at low temperatures, a smooth, colorless film, in about 10 days. This film was much firmer than one obtained from fatty oils. Complete hydrogenation of squalene results in the production of an oil-like substance, resembling liquid paraffin. When subjected to a temperature of —80° C. this oil-like product becomes a transparent jelly, resuming its mobile character at about —35° C.—J. Ind. Eng. Chem., 8 (1916), 889.

CARBOHYDRATES.

Reducing Sugars.—*Indirect Determination.*—Avanti offers the following method for estimating reducing sugars: Fifty mils of Fehling's solution are boiled with a measured amount of a 1 per cent. sugar solution for 2 minutes in the case of glucose, four minutes in the case of maltose, and 6 minutes when lactose is to be estimated. The cuprous oxide is allowed to settle, collected on a filter, and after being washed well with water, filter and oxide are transferred to a beaker and stirred well with 25 mils of a 10 per cent. ferric alum solution in 10 per cent. sulphuric acid until the oxide is completely dissolved. The amount of ferrous sulphate formed is then estimated in the usual way with N/10 potassium permanganate solution. The number of mils of the latter consumed multiplied by 0.0063 gives the amount of metallic copper corresponding to the sugar in 10 mils of solution.—Boll. chim. farm.; through Drug. Circ., 60 (1916), 547.

Caramel.—*Reagent for Detection of.*—Some years ago G. H. P. Lichthardt suggested the use of the following reagent to detect the presence of caramel in flavoring extracts:

Tannic acid	1.00 Gm.
Sulphuric acid	0.75 Gm.
Water to make	50.00 Gm.

The tannic acid is dissolved in about 30 mils of water, the sulphuric acid added, and after the precipitate which is formed is redissolved, the balance of the water is added.

The test has since been used to determine the presence of caramel in vinegar. The vinegar is carefully neutralized and about 5 mils mixed with an equal amount of the test solution. The mixture is slightly warmed and allowed to stand for 24 hours, when if caramel is present a dark-colored precipitate will be deposited.

An attempt was made to detect chicory in infusion of coffee, but proved unsuccessful, as it was found that while chicory infusion gave a dark precipitate, coffee also gave a more or less colored precipitate, which while it differed slightly from that thrown down by chicory, could not be distinguished in an infusion of a mixture of the two substances.—Jour. A. Ph. A., 5 (1916), 294. (L. S.)

Nettle Fiber.—Dr. Oswald Richter advocates the cultivation of nettles, from which a fiber can be easily separated, which will take the place of cotton which can be dyed well and which can be made waterproof.—Sc. Am. Suppl., 1916, No. 2118, 96. (O. R.)

Cotton.—*Manufacture into Absorbent Cotton Wool.*—A. N. Gerrard in a comprehensive paper describes the treatment that raw cotton undergoes in becoming absorbent cotton.

The great bulk of surgical cotton is not made from pure cotton fiber. The common practice is to employ mixtures of pure wool with cotton wastes which are by-products of carding and spinning the better cotton. Varying proportions give various qualities of absorbent wool at about half the price that one made from all new fiber would bring.

Of all the steps in its manufacture the cleansing and bleaching are the only ones that can be mentioned here. The cotton is put into a solution of sodium hydroxide, and steam under pressure forced through it to remove wax, resin, and grease, thereby increasing its absorbent powers. Washing with cold water frees it from soda. Next comes bleaching or "chemicking:" the cotton is allowed to stand for several hours in a solution of chlorinated

lime about 0.15 per cent. strong. This liquid is withdrawn and the "souring" done by adding sulphuric or hydrochloric acid, followed by thorough washing with soft water. Then it is soaped to increase absorbency and blued and washed again. A final "dosing" with tartaric acid imparts crispness. In the bleaching there is a loss in weight of 10 to 15 per cent.

The term absorbent is comparative. All cottons absorb water but the absorbent cotton wools from 14 to 16 times their weight.

Cotton wool is hygroscopic, containing an average of 8 per cent. of water. The purer the cotton the higher the temperature it will resist: pure cotton can be heated to 260° F. but those made from wastes crumble to dust.—Pharm. J., 96 (1916), 573. (Z. M. C.)

Cellulose Acetate.—*Use in Aeroplane Varnish.*—The preservative varnish used in the manufacture of aeroplanes, known as "dope," consists of cellulose acetate, or celluloid, dissolved in tetrachlorethane with amyl alcohol and benzene. The cases of poisoning which are reported from time to time are caused by a specific action of tetrachlorethane on the liver.—Chem. and Drug., 88 (1916), 156. (K. S. B.)

Glucose.—*Food Value and Digestibility.*—Wesener and Teller report on comparative experiments on the action of fermentative and hydrolytic agents on the carbohydrates entering into common foodstuffs, such as potatoes, bread, and cereals, and upon pure starches, which have been made under like conditions with commercial glucose. The carbohydrates of glucose are found to agree closely in gas production with those of the more readily digested among the starchy foods. It is almost wholly fermented when first treated with diastase, and then with yeast; being practically entirely converted into alcohol and carbon dioxide. It does not form, as many of the starchy foodstuffs do, any appreciable quantity of secondary unfermentable carbohydrates. It is, therefore, a more concentrated and more readily assimilable food than are most of the carbohydrates present in ordinary foods. These latter have first to undergo cooking, and then complete hydrolysis by the action of the digestive enzymes before they can be utilized in the body. In this respect dry glucose, weight for weight, will furnish at least as much energy as cane sugar, and much more than many forms of starchy diet.—J. Ind. Eng. Chem., 8 (1916), 1009.

Honey.—*Action on the Teeth.*—Honey taken by itself has a very bad effect upon the teeth, but this may be counteracted by admixture with 1 per cent. of tartaric acid. H. P. Pickerill, in the "New Zealand Dental Journal," concludes: "We may take sugar and honey with impunity to our teeth if it be combined with an acid, preferably a natural organic acid such as is found in fruit or salad, or if the meal be followed by some acid sweet fruit." Tables are given of the acids formed in the mouth five minutes after eating various food materials.—Chem. and Drug., 88 (1916), 55. (K. S. B.)

Inositol.—*Extraction from Brain Tissue.*—G. Momose states that inositol may be extracted from human or ox brain substance by extracting it with acetone. After distilling off the solvent, the residue is precipitated, first with neutral lead acetate, then with basic lead acetate. Inositol is obtained from the second lead precipitate. It is identical with the ordinary *i*-inositol obtained from plants.—Biochem. J.; through Pharm. J., 97 (1916), 181.

Maltose Syrup.—*Process for Making.*—N. Keulemans gives the following process for making maltose syrup. Powdered malt (200 grammes) is allowed to macerate with 100 mils of water for about 2 hours at 35 to 40° with occasional shaking. Wheat starch (1600 grammes) is mixed with 1600 grammes of water and then boiling water is added until a stiff paste is formed, to which the extract of malt is added. Within a few minutes the mixture becomes liquid. It is then heated for $2^1/_2$ hours at 70 to 75° (at this temperature the diastase is not destroyed), filtered and evaporated to a syrupy consistency. Then the percentage of solid matter is determined and for every 3 grammes 5 mils of a 1 per cent. sodium chloride solution are added. If a powdered product is desired the evaporation to dryness should be carried out in a vacuum.—Pharm. Weekblad, 53 (1916), 257. (H. E.)

Molasses.—*Production of Indol and Skatol during Strontium Treatment.*—During molasses desaccharization by the strontium method, boiling of the molasses with an excess of the alkaline earth causes the formation of vapors with a strongly fecal odor. In the condensate of the vapors, indol and skatol were isolated by Edm. O. v. Lippmann. Indol, C_8H_7N, when recrystallized from ligroin, was obtained as shining white leaflets melting at 52° C. With picric acid it produced the red needles of the picrate, C_8H_7N.-

$C_6H_3O_7N_3$. The skatol, C_9H_9N, was obtained from ligroin as white leaflets melting at 95° C. Both bodies possessed a strongly fecal odor.

According to the author the indol and skatol are produced from albuminous substances or their disintegration products on boiling the molasses with alkaline earths.—Ber.; through Apoth. Ztg., 31 (1916), 33. (J. H. W.)

Paper Textiles.—From times immemorial the Chinese and Japanese have employed paper in making rope and also fine yarn, used in weaving. Even to-day it is not unusual for a Chinese merchant in Hong Kong to twist a strip of paper to tie a bundle for his Celestial customer. In the United States after the Civil War, during the memorable cotton famine period, attempts were made to produce paper twine. One of these mills is still in existence in the South. Experiments with paper textiles have never ceased in Germany, Sweden and England. In 1892, two German engineers, Keller and Turk, produced the first commercial paper twisting machine, which in 1897 was followed by another type by Claviez, and shortly after two other Germans, Muller and Kron, brought out still another twister.

Besides paper twine and yarn, the paper fabric industry also produces fiber floor coverings and bagging and burlap. Paper can be substituted for many other fibers, and a great industry can be built up.—Textile World Journal; through Sc. Am. Suppl., 1916, No. 2102. (O. R.)

Pectin Gels.—Pectin, an organic acid, and sugar are the important factors in the production of fruit jellies. All three substances, either singly, or in combination, increase the viscosity of a jelly. Mixtures containing any two of them, or a mixture containing all three, have a viscosity greater than the combined total of the individual viscosities. Jellification will take place in a solution containing 3 per cent. of pectin, and 65 per cent. of sugar. Independent of increasing the viscosity, sugar seems to act as a dehydrating agent. McNair obtained the pectin with which he experimented by boiling lemon peel with alcohol, subsequently boiling the peel with water at 110° C., and filtering. The aqueous filtrate is treated with twice its volume of alcohol, the precipitate thus obtained washed with alcohol and ether, and finally dried over sulphuric acid.—J. Phys. Chem.; through C. U. C. P. Al. J., 23 (1916), 9. (G. C. D.)

Pertinax.—*Paper for Insulation.*—It is made in Germany by rolling layers of paper on one another and impregnating the mass with some kind of resin with heat and pressure. The resulting "hard paper" is uniform in structure, waterproof and is as free from chemical action as porcelain. It will stand temp. of 180 to 200° C. without harm and can be used as an insulator, replacing porcelain for pressures above 20,000 volts.—Sc. Am., Jan. 15, 1916, 75. (O. R.)

Starch.—*Factors Affecting the Iodine Reaction.*—A. Clementi calls attention to the disturbing influence of certain substances on the color reaction between iodine and starch. He finds that the presence of furfurol inhibits or destroys the blue coloration. The rapidity of the color destruction is directly in proportion to the amount of furfurol present, and in inverse proportion to the amount of iodine present. Thus, in a mixture containing a large proportion of iodine and a small proportion of furfurol, the loss of color is not noted. The presence of other protein bodies, such as albumins, globulins, plant proteins, albuminoids and phosphoproteins, also causes a more or less rapid loss of color.—Arch. Farm. Sper.; through C. U. C. P. Al. J., 23 (1916), 234. (G. C. D.)

Starch.—*Phosphoric Acid in.*—Northrop and Nelson discuss the presence in, and the possible combination of phosphoric acid in starch; giving the results of an investigation showing its presence in chemical combination and not as the result of contamination. Experimental data are given.—J. Am. Chem. Soc., 38 (1916), 472. (B. J. D.)

Starch.—*Use in Green Leaves.*—F. W. Neger studying the starch content of different kinds of summer and evergreen leaves found that most starch is present in the late afternoon, and that it attains a considerable value in moderately warm weather. At high temperatures the value falls, due to migration of the starch to the stem. If the leaves are separated from the stems, the carbohydrates remain in the former, and are converted into sugar. In evergreens, a considerable accumulation of starch occurs. In Euonymus japonica a starch content of 44.6 Gm. per square meter of leaf surface was found. The needles of coniferous evergreens contain large quantities of starch, particularly in the autumn and spring.—Naturwissenschaften; through Pharm. J., 97 (1916), 505.

Sterilin.—*A Substitute for Rubber.*—Sterilin, the invention of Dr. Colman, is a solution of cellulose esters in organic solvents.—Chem. and Drug., 88 (1916), 55. (K. S. B.)

Spider Silk.—A. Herzog calls attention to the fact that Malagasy spider Nephila madagascarensis spins a lustrous white or orange-yellow silk having a solid fiber almost circular in section, with the average diameter of 6.9 μ, and therefore the finest of any insect or animal silk, being of less diameter than artificial silk. It is structureless and practically transparent and not covered with any gummy matter, like the sericin of silkworm silk. Its density is practically the same as that of the latter. It swells considerably in water, and simultaneously the fibers contract materially in length.—Kunststoffe; through Pharm. J., 96 (1916), 521.

ORGANIC ACIDS.

Abietic Acids.—Proth agrees with Tschirch, that abietic acid is a derivative of the hydrogenated resene. He finds that American colophony contains 31 per cent. of α-abietic acid, 31 per cent. of β-abietic acid, 10 per cent. of γ-abietic acid and 10 per cent. of resene as well as traces of bitter substances and essential oil.—Z. angew. Chem.; through Chem. Abstracts, 10 (1916), 2613.

Acetic Acid.—*Detection of Formic Acid in.*—On the property of formic acid of being easily oxidized by boiling with sulphuric-chromic acid, which does not attack acetic acid, Szeberányi has based the following method for detecting formic acid in acetic acid: Twenty mils of the acid under examination, which should preferably contain not more than 6 to 8 per cent. of absolute acid, are mixed with 20 mils of concentrated sulphuric acid and 2 to 3 mils of a 50 per cent. chromic acid solution. If formic acid is present, a strong evolution of carbon dioxide takes place and green chromic sulphate is formed. Strong acid should first be diluted with water in order to prevent propionic acid or other impurities present in the acid from reducing the chromic acid.—Z. Nahr. Genussm.; through Drug. Circ., 60 (1916), 389.

Acetylsalicylic Acid.—*Idiosyncrasy to.*—O. af Klercker cites seventeen cases from the literature and reports three from his own practice in which the therapeutic administration of acetylsalicylic acid was followed by edema, the lids and face swelling, the skin puffing up sometimes down as far as the chest and other toxic manifestations. Some instability of the vasomotor system is

evidently responsible for the trouble, but nothing of the kind had been known in the families before.—Hygiea; through J. Am. Med. Assoc., 66 (1916), 1282. (W. A. P.)

Acetylsalicylic Acid.—*Incompatibility with Quinine.*—It has been asserted that a mixture of quinine sulphate and acetylsalicylic acid forms a poisonous substance (quinotoxin), isomeric with quinine and resembling digitoxin in its action. A mixture of 5 Gm. each of quinine sulphate and acetylsalicylic acid became liquid and smelt strongly of acetic acid. The explanation of this is that the water of crystallization in the alkaloidal salt dissociates the acetylsalicylic acid, and the liberated acids convert the quinine into quinotoxin. It is well known that prolonged heating with glacial acetic acid converts some of the cinchona alkaloids into poisonous isomers, and it has also been shown that an easily dissociated acid, such as acetylsalicylic acid, may have the same effect. At body temperature, however, the action takes place much more slowly, though it is possible that in quinine and aspirin powders which have been kept for some time, a dangerous quantity of quinotoxin may have been formed. It appears to be a combination that should be avoided. The danger does not exist with mineral acids and quinine.—Prescriber; through Pharm. J., 97 (1916), 27.

Acetylsalicylic Acid.—*Melting Point of.*—E. J. Parry thinks that while the tests of the British Pharmacopœia are loosely worded, the melting point established by that standard is not too high; since its true melting point is nearer to 136–137° than to any other figure. He discusses the work of Tsakalotos and Horsch (Year Book, 1915, 317) on acetylsalicylic acid and considers their results indefinite unless the investigators can show that the acid used by them was free from acetylsalicylo-salicylic acid; an impurity frequently present in the commercial product.—Chem. Drug., 88 (1916), 611.

Acetylsalicylic Acid.—*Determination of Free Salicylic Acid in.*—G. N. Watson states that of late considerable acetylsalicylic acid adulterated with salicylic acid has been brought upon the market. The following method is for determining the amount of this adulterant. The method is applicable to mixtures of the salicylic acid or to salicylic acid alone. Ten mils of a solution containing about 10 milligrammes are used. Twenty mils of N/10 bromine solution are added followed by 75 mils of water and 5 mils of hydrochloric acid. Allow the mixture to stand with occasional stirring

for ten minutes, and then add 5 mils of potassium iodide, T. S. The liberated iodine is titrated with N/10 sodium thiosulphate, V. S. One mil of N/10 bromine solution consumed corresponds to 0.002283 gramme of salicylic acid.—Drug. Circ., 60 (1916), 7. (H. H. S.)

Acetylsalicylic Acid.—*Tests for.*—D. E. Tsakalotos states that it is difficult to determine the melting point of acetylsalicylic acid with any degree of certainty because of the likelihood of liberation of acetic acid and the formation of salicylo-salicylic acid with any degree of certainty. If pure acetylsalicylic acid be dissolved rapidly in alcohol, and water added, the resulting solution does not at once show the characteristic reaction with diluted ferric chloride. If, however, the solution be allowed to stand for some time before adding the diluted ferric chloride, a violet coloration will be noted. A sample of the acid heated sufficiently to liquefy it, then allowed to cool and dissolved in water, produces an immediate and intense color reaction with ferric chloride. If it is heated for some time above its melting point, allowed to cool and then dissolved in alcohol, the addition of water causes a precipitation of salicylo-salicylic acid, and the addition of diluted ferric chloride a pale violet coloration. Self's vanadium reagent for salicylic acid when added to acetylsalicylic acid, in dry form, does not at once show any reaction. In a short while, however, a yellowish green color is produced, changing later to an intense green. In case the acid has been previously heated to its melting point, the intense green color is noted at once. If previously heated above its melting point, the green color is noted, but changes very rapidly to a deep brown. Self's reagent may be prepared as follows: Dissolve a small quantity of ammonium vanadate in concentrated sulphuric acid, and add water until the orange color produced begins to lose its intensity. The addition of formaldehyde is not essential.—J. pharm. chim.; through C. U. C. P. Al. J., 23 (1916), 252. (G. C. D.)

Aspirin.—*Quality of French Tablets of.*—E. Bonjean has examined 10 brands of aspirin tablets marketed by French manufacturers. Of these, seven contained the amount of acetylsalicylic acid indicated on the label. Each contained also about 20 per cent. of starch. Two of the brands of tablets contained no acetylsalicylic acid whatever. These were labelled "Asparine francaise asparaise" and "Asparaise L." respectively. The tenth brand

labelled "Aspirine, antifébrinée" contained only 50 milligrammes of acetylsalicylic acid instead of the usual 500 milligrammes.—J. pharm. chim., 14 (1916), 19.

Calcium Acetylsalicylate.—*Manufacture.*—A German patent has been granted J. A. Wulfing for preparing calcium acetylsalicylate by mixing molecular quantities of acetylsalicylic acid and calcium hydroxide intimately in a dry condition. The mixture is then treated with either alcohol, ethyl acetate, or acetone and triturated until it is completely soluble in water. The solvent is subsequently removed and the resulting dry mass consisting of calcium acetylsalicylate is broken up and powdered. It is necessary to subsequently extract with ether until the product is neutral.—C. U. C. P. Al. J., 23 (1916), 218. (G. C. D.)

Benzoic Acid.—*Detection in Fats.*—W. Stadlin recommends the following method for the detection of benzoic acid in edible fats: From 20 to 30 grammes of the fat, in a semi-melted condition, are spread evenly over the parchment diaphragm of a Kreis dialyzer, and covered with 50 per cent. alcohol. The outer chamber of the dialyzer is also filled with alcohol of the same strength. After 24 hours the dialysate is made slightly alkaline and heated on a water-bath to remove alcohol, the original volume of liquid being maintained by addition of water. The liquid is then made slightly acid and extracted twice with ether. The combined extracts are allowed to vaporize at a low temperature, and the residue, in the form of fine crystalline needles, is dissolved in 10 mils of water. To this solution are added 3 drops of diluted (1 in 10) solution of hydrogen dioxide, 3 drops of diluted (1 in 10) solution of ferric chloride, and 3 drops of 3 per cent. ferrous sulphate solution. If benzoic acid was present a violet coloration (salicylic acid) will appear in about one-half minute. The same method may be employed if the presence of salicylic acid is also suspected, only in that event, the solution of ferric chloride is added without previously oxidizing with hydrogen dioxide.—Chem.-Ztg.; through C. U. C. P. Al. J., 23 (1916), 249. (G. C. D.)

Benzoic Acid.—*Detection in Food.*—A modification of the so-called Mohler reaction is proposed by J. Grossfeld as follows: The acid is removed by the aid of ether or other appropriate solvent, and the solution thus obtained is vaporized to dryness at low temperature. The residue obtained is heated on a water-bath for twenty minutes, after adding 0.1 gramme of potassium nitrate

and 1 mil of concentrated sulphuric acid. After cooling 2 mils of water are added, the mixture being again heated and subsequently cooled. It is then treated with an excess of ammonia water, and mixed with 2 mils of a solution made by dissolving 2 grammes of hydroxylamine hydrochloride in 100 mils of water. If benzoic acid is present a red coloration will be noted. The color reaction is more intense if the mixture be warmed and then rapidly cooled. Cinnamic acid produces a similar reaction, but salicylic acid may be readily differentiated.—Chem.-Ztg.; through C. U. C. P. Al. J., 23 (1916), 219. (G. C. D.)

Bromacetates and Brompropionates.—*Displacement of Bromine in.*—It was found by George Senter and H. Wood that the rate of displacement of bromine in sodium bromacetate by sodium ethoxide is proportionate to the concentration of the two substances. Ethyl alcohol and sodium ethoxide displace the bromine from α-bromopropionic acid at comparable rates with production of ethoxypropionic acid.—Chem. and Drug., 88 (1916), 45. (K. S. B.)

Cinnamic Acid.—*Its Use as Preservative.*—A medical board in Germany warns against the indiscriminate substitution of cinnamic acid for boric acid and other preservatives since the therapeutic action of cinnamic acid has been tried only on a small variety of animals and records in regard to its action in the human body are not at all available.—Pharm. Weekblad, 53 (1916), 1619. (H. E.)

Citric Acid.—*Production by Fermentation.*—J. A. Martin describes his experiments in the production of citric acid from dextrose by use of moulds. He prepared cultures from four species of Mucor, two species of Citromyces, two species of Penicillium and four species of Aspergillus and tried their effect on a nutritive solution containing 3.9 Gm. ammonium phosphate, 1.05 Gm. acid potassium phosphate, 0.5 Gm. magnesium sulphate, 0.05 Gm. calcium nitrate, 100 mils (?) dextrose and 1000 mils distilled water. Fermentation lasting 10 and 20 days, respectively, showed that the Citromyces cultures were the only ones in which citric acid was produced and in one of these, enough acid was produced in 20 days to neutralize 42.9 mils of N/20 sodium hydroxide, V. S. In a second series of experiments, the favorable Citromyces sample was used to ferment 5000 mils of the nutrient solution and after 20 days it was found that 20 per cent. of the dextrose used had been converted into citric acid; while by cautious neutralization

of the liquid with calcium carbonate, after sixty days a yield representing 43 per cent. of the dextrose taken was obtained.

Theoretically 11 grammes of dextrose should yield 6 grammes of citric acid.

The article gives descriptions of the 12 types of mould employed. —Am. J. Pharm., 88 (1916), 337.

Sodium Citrate.—*Use as Rust Remover.*—Friend and Marshall, in "Journal of the Iron and Steel Institute," state that a 20 per cent. solution of sodium citrate readily removes rust from iron. Saturated solutions of boric acid also act rapidly, and only dissolve iron slowly after the rust has been removed.—Chem. and Drug., 88 (1916), 70. (K. S. B.)

Diphenylpyruvic Acid.—Although free crystalline phenylpyruvic acid is represented by the enol formula $C_6H_5—CH = COH—CO_2H$ it is very readily transformed into α-cetonic acid, and often reacts in this form. R. Hemmerlé has investigated whether most α-cetonic acids can combine with themselves by aldolization to give a diphenylpyruvic acid, and finds that this is the case. The condensation can be effected by starting with the acid itself and using dilute soda, but the yields are poor, and a better result is obtained by using the methyl and ethyl ethers of phenylpyruvic acid which, when condensed by aqueous soda, ammonia, or even potassium bicarbonate, give good yields of diphenylpyruvic acid. —Compt. rend.; through Chem. News, 114 (1916), 36.

Formic Acid.—*Detection in Vinegar.*—A simple method for detecting formic acid in vinegar depends upon the fact that boiling acidulated (with sulphuric acid) chromic acid solution readily oxidizes formic acid without changing acetic acid.

According to P. Szeberényi, 20 mils of the vinegar to be tested (containing 6–8 per cent. acid) are placed into a small flask, 20 mils concentrated sulphuric acid added and the strongly warm mixture treated with 2 to 3 mils 50 per cent. chromic acid solution. If formic acid is present, the chromic acid is reduced in a few minutes to green chromium sulphate with vigorous evolution of carbon dioxide. Acetic acid alone produces no perceptible change. Concentrated vinegar is first to be diluted with the tenfold quantity of water to prevent propionic acid or other impurities in the vinegar from producing a noticeable reaction. Wine vinegar or other vinegar containing much extractive cannot be tested in the above manner because the alcohol possibly present or the extractive may reduce.

The heat necessary for the reaction is produced during the mixing of the sulphuric acid with the vinegar; thus the reaction may readily be accomplished at any place without the use of fire. —Z. Nahr. Genussm.; through Pharm. Ztg., 61 (1916), 107. (J. H. W.)

Why Glycerophosphates?—The glycerophosphates are split up in the intestines into ordinary phosphates and absorbed and utilized, if they are utilized at all. There is no evidence that glycerophosphates have any pharmacologic action to warrant the belief that they are of use as therapeutic agents. The belief in their value is kept alive by the promotion of certain proprietary mixtures. The glycerophosphates will be continued to be manufactured until physicians refuse to prescribe them. A manufacturer has even substituted glycerophosphates for the potent yellow phosphorus in his elixir of phosphorus, nux vomica and damiana and, so his chemist reports, physicians continue to prescribe the proprietary the composition of which has been altered.—J. Am. Med. Assoc., 66 (1916), 1205. (W. A. P.)

Sodium Glycerophosphate.—*Process for Making.*—Wülfing's process for making sodium glycerophosphate depends on the action of metaphosphoric acid and glycerin according to the equation

$$HPO_3 + C_3H_5(OH)_3 = C_3H_5(OH)_2 - O - PO(OH)_2$$

by which the monoester is formed. Since, however, the commercial metaphosphoric acid is a mixture of the free acid and its sodium salt and since the former had a bad influence on the reaction, the commercial salt was converted into sodium metaphosphate by heating with anhydrous disodium hydrophosphate. For this purpose, an analysis of the commercial salt is necessary. In order to avoid an analysis and to obtain a cheap product to start with, J. M. A. Hegland tried to heat anhydrous sodium pyrophosphate and anhydrous glycerin to obtain sodium glycerophosphate according to the equation

$$Na_4P_2O_7 + 2C_3H_5(OH)_3 = 2C_3H_5(OH)_2.O.P\begin{matrix}=O\\ -ONa\\ -ONa\end{matrix} + H_2O.$$

The results were not satisfactory. He therefore tried to make a pure and cheap sodium metaphosphate by heating sodium pyrophosphate with orthophosphoric acid according to the equation

$$Na_4P_2O_7 + 2H_3PO_4 = 4NaPO_3 + 3H_2O.$$

He heated 446 Gm. of crystallized sodium pyrophosphate with 776 Gm. of 25 per cent. phosphoric acid until most of the water was expelled and a mass was obtained which became hard on cooling. This mass was disintegrated and heated again until about 408 Gm. of a fine powder were obtained. This powder was heated with 400 Gm. of glycerin at a temperature not exceeding 210°, preferably at 190°, replacing from time to time any glycerin lost by evaporation. When the reaction is complete, which can be easily ascertained by titration and by the perfect solubility of the salt in water, the tarry, light brown mass is dissolved in an equal amount of water and neutralized with strong caustic soda solution. It is then shaken with milk of lime until the filtrate no longer gives a reaction with magnesia mixture. The liquid is then filtered, decolorized with animal charcoal and evaporated until a 50 per cent. product is obtained. By evaporating the liquid to syrupy consistence and treating the residue with strong alcohol the salt can be obtained in the form of a crystalline powder.—Pharm. Weekblad, 53 (1916), 1645. (H. E.)

Sodium Glycerophosphate.—*Structure.*—The structure of crystallized sodium glycerophosphate represents the molecule as containing phosphoric acid in which one hydrogen atom is esterified with glycerin, while the other two hydrogens are replaced by sodium. But the question is left open as to whether the glycerin group is joined by the primary or secondary alcoholic group. Carre and Paolini, who have studied the problem, have arrived at opposite conclusions, the former stating that the glycerin is joined in the alpha position, by means of a primary alcohol group, while the latter considers the ester as the beta form, in which the glycerin is joined by the secondary alcohol group. These results were based on a study of brucine glycerophosphate prepared from the sodium salt. Grimbert and Bailly attack the question in a new manner, by observing the effect of oxidizing agents, such as bromine water, on the glycerin group. They find that 24 hours of oxidation in the cold, by means of bromine water, give a reaction product with crystallized sodium glycerophosphate which reacts with Denigès' resorcinol solution, forming a colored substance, while the uncrystallizable sodium glycerophosphate does not give such a product. The ester containing the primary alcoholic group

would alone be capable of forming an acetone derivative which would react with the Denigès' reagent, and it is found that only the uncrystallizable salt of sodium behaves in this way. It is therefore concluded that the crystallized salt has the beta form, and that the alcohol grouping in it is secondary.—J. pharm. chim.; through Pract. Drug., July, 1916, 39.

Glycocoll.—*A New Copper Combination of.*—According to J. Ville, if glycocoll and copper sulphate are allowed to react in the absence of potassium hydroxide solution, results are obtained which vary with the relative amounts of the two constituents employed. Thus from 4 molecules glycocoll and 1 molecule copper sulphate there is obtained, if the reaction liquid is precipitated with alcohol, the well-known copper glycocollate, $(NH_2CH_2COO)_2Cu + H_2O$. If, however, only 2 molecules glycocoll are used, the sulphate of copper glycocollate, $H_2SO_4(NH_2CH_2COO)_2Cu$, is produced in the form of blue drops readily soluble in water, insoluble in alcohol, ether, chloroform and benzol, drying *in vacuo* over sulphuric acid to a transparent, hygroscopic resin, and becoming completely anhydrous at 120° to 125° C. The same compound is obtained from copper glycocollate and sulphuric acid, as well as from glycocoll sulphate and copper hydroxide. The new compound is decomposed by potassium or sodium hydroxide or by copper hydroxide into copper glycocollate and alkali sulphate or copper sulphate.—Bull. soc. chim. France; through Apoth. Ztg., 30 (1916), 24. (J. H. W.)

Hydrocyanic Acid.—*Assay of.*—D. B. Dott reports the results of some tests carried out to determine the comparative accuracy of the old and the new B. P. methods for volumetric estimation of hydrocyanic acid. The old method was titration with standard silver solution after the addition of exactly the equivalent of soda required. Squire's "Companion" claims also that any chloride present is estimated with the hydrocyanic acid. The present process, which is titration with silver nitrate solution after the addition of an excess of ammonia and a little potassium iodide, is thought to eliminate the errors of the former.

A sample tested by the new method was used as a check against the same acid tested by the old method, both with a slight and with a considerable excess of alkali and with and without added sodium chloride, with the following conclusions:

"1. That the new method gives practically the same percentage as the old.

2. That presence of chloride makes no appreciable difference.

3. That considerable excess of alkali causes only a slight error."

In testing the volatility of hydrocyanic acid in dilute solution Mr. Dott found that 10 mils containing 4.84 per cent. exposed in a cylindrical measure of 12 Mm. diameter for two hours at about 16° C. tested 4.27 per cent. w/v, a loss of one-ninth.—Pharm. J., 96 (1916), 368. (Z. M. C.)

Malonic Acid.—*Detection.*—J. Bougoult makes use of the property possessed by malonic acid of forming definite compounds with aromatic aldehydes. He also calls attention to the fact that during the oxidation of many organic bodies, malonic acid is formed. The method is as follows: To 0.10 gramme of malonic acid are added 15 drops of cinnamic aldehyde and 1 mil of acetic acid. The mixture is heated in a sealed glass tube, in a water-bath containing boiling water, for a period of 10 hours. To the hot solution are then added 15 mils of water and enough sodium carbonate to saturate. The solution at once assumes a yellow color, and upon cooling a yellow precipitate is noted. This precipitate is collected in a tared Gooch crucible and dried at 100° C. 0.10 gramme of malonic acid will yield about 0.110 gramme of cinnamylmalonic acid. The latter has a melting point of 208° C. The presence of alkaline salts, mineral or organic acids, as well as oxalic or succinic acid does not influence the result.—J. pharm. chim.; through C. U. C. P. Al. J., 23 (1916), 86. (G. C. D.)

Meta-cresotic Acid.—*Use as Preservative.*—K. B. Lehmann states that a mixture of equal parts of benzoic and meta-cresotic acids has been used under the name of "hydric acid" as a dietetic preservative for fruit preserves. It is stated that no unpleasant effects have been observed to follow the daily consumption for fourteen consecutive days of marmalade containing 0.25 per cent. of the mixture. It is inferred therefore that "hydric acid" is harmless when used as a food preservative.—Chem.-Ztg.; through Pharm. J., 97 (1916), 433.

Meta-tartaric Acid.—*Non-existence of.*—Ever since the publication in 1831 of a paper by Braconnot on an isomere of tartaric acid produced by its fusion, meta-tartaric acid has figured in chemical literature. L. Zwikker now claims that such an acid is

non-existent; that what has been presented as such is merely ordinary tartaric acid with some impurities produced by the heat of fusion. In fact from the so-called meta-tartaric acid he has obtained by crystallization pure tartaric acid.—Rec. trav. chim. des Pays-Bas; through J. pharm. chim., 14 (1916), 51.

Oxalic Acid.—*Production by Fermentation.*—Currie and Thom have discovered a new Penicillium which produces oxalic acid from many carbonated media, such as those containing cane sugar, lactose, potato starch, or peptone. This organism has been named Penicillium oxalicum, and is the only mould of the genus Penicillium known to form oxalic acid. Its action in this respect is less rapid than that of Aspergillus niger. When calcium carbonate is added to the medium, the mould grows less vigorously, but the yield of oxalic acid is greatly increased, and may attain to 40 per cent. of the weight of the sugar present. Oxalic acid is not an end product of the biochemical action of the mould; after eight to twelve days the amount formed reaches a maximum, and then diminishes in quantity.—J. Biol. Chem.; through Drug. Circ., 60 (1916), 144.

Phenylbromacetic Acid.—*Dissociation Constant.*—In part of a continued paper on "Studies on the Walden Inversion," George Senter and H. Wood, from a comparison of the rate of displacement of bromine from the sodium salt of phenylbromoacetic acid and from the free acid in presence of excess hydrobromic acid, conclude that the reaction in both cases proceeds mainly by the action of water on the $C_6H_5CH\begin{cases}Br\\ \\COO\end{cases}$ ion, the non-ionized acid playing practically no part in the process. The rate of displacement of bromine from the sodium salt is not affected by the addition of sodium hydroxide in fairly high concentration.—Chem. and Drug., 88 (1916), 45. (K. S. B.)

Picric Acid.—*Assay.*—Minovici and Kollo have found that when titrating picric acid with alkali in the presence of phenolphthalein, more alkali is used than when using methyl red as indicator. This may be due to the property of picric acid to bind the phenolphthalein, which on the addition of caustic alkali undergoes a molecular rearrangement. The end point in the titration is very sharp when methyl red is used, while with phenolphthalein an intermediate brownish color is produced.—Ac. Rom. Bull.; through Drug. Circ., 60 (1916), 19.

Picric Acid.—*Assay.*—Owing to the reducing action of titanous chloride ($TiCl_3$) on such groups as nitro and azo, it has come into use for the volumetric estimation of some organic compounds. The B. P. method of estimation of picric acid by direct titration with half-normal sodium hydroxide solution has a limited application since small quantities of either acid or alkali impurities, in either the acid or its salts, interfere; nor can it be used for metallic picrates.

Titanous chloride detects minute quantities of picric acid even when acids or alkalies are present and may be employed whenever no oxidizing substance is present.

Boon and Ogilvie prepare a standard solution of $TiCl_3$; the commercial 20 per cent. solution is treated with concentrated hydrochloric acid, boiled, cooled and diluted. The solution is kept under hydrogen and periodically standardized against ferrous-ammonium sulphate freshly oxidized by potassium permanganate.

In applying the test to solutions containing picric acid, reduction is effected by boiling with hydrochloric acid and an excess of the standard ferric alum solution using ammonium thiocyanate as indicator.

The nitro group is reduced to the amino group as indicated by the following reactions:

$$18TiCl_3 + 18HCl \longrightarrow 18TiCl_4 + 18H$$
$$18H + C_6H_2(NO_2)_3OH \longrightarrow C_6H_2(NH_2)_3OH + 6H_2O$$

—Pharm. J., 97 (1916), 213. (Z. M. C.)

Picric Acid.—*Color Reaction.*—J. Castets detects picric acid by treating from 5 to 10 mils of the liquid to be tested with 5 to 10 drops of saturated aqueous solution of bromine, which is then heated to boiling and quickly cooled. The bromo-dinitrophenol thus formed, being very soluble in ether, is shaken out with that solvent. The ether solution is separated, filtered, and a portion evaporated in a white capsule. The dry residue thus obtained when exposed to the vapor of ammonia gives a red color. Another portion of the ether solution may be evaporated drop by drop on a small square of white filter paper in a porcelain capsule, floated on warm water. When dry, this is cut in two. One piece, exposed to ammonia vapor, but not in excess, gives a carmine-red color if picric acid is present. The other piece of paper is touched with a drop of 1 : 50 or 1 : 100 solution of potassium cyanide, and

warmed to evaporate the moisture. A red zone formed on the margin of the drop indicates the presence of bromo-dinitrophenol. In the case of urine, 100 mils of the sample acidified with 2 mils of hydrochloric acid are shaken out with 10 or 20 mils of chloroform or ether. After separating and evaporating the volatile solvent in a small capsule floated on warm water, the residue is taken up with 5 mils of water and treated as above with the bromine reagent. With beer, 100 or 200 mils are evaporated to 20 or 40 mils, then extracted with four or five times its weight of alcohol 95 per cent., leaving the solvent in contact for twelve hours, with occasional agitation. The alcohol is then decanted, and the residue again extracted in a similar manner. The bulked alcohol solutions are distilled, and the residue, diluted with water and strongly acidified with hydrochloric acid, is treated as described above in the test for urine.—J. pharm. chim.; through Pharm. J., 96 (1916), 165.

Picric Acid Intoxication.—*A Chemical Study of.*—H. Pecker describes at length the symptoms of poisoning by picric acid, which is now so largely used in the war zone by malingerers. In 9 to 11 gramme doses it is frequently fatal, acting as a congestant and asphyxiant. In small doses it produces a jaundice and a mild gastro-intestinal trouble simulating icterus. The deception can be detected by the identification of picrates and picramates in the feces and the urine. Among the tests employed are: (*a*) the cherry-red ring produced by diamidonitrophenol with picric or picramic acid; (*b*) the rose-lilac tint produced by nitro-naphthol with picramic acid.—Arch. de Méd.; through J. pharm. chim., 14 (1916), 152.

Pyroligneous Acid.—*Determination of Ingredients of.*—Vanderkleed and E'we determine the amount of acetone in pyroligneous acid by diluting 2 mils of the sample with 40 mils of water and adding 50 mils of a reagent made by dissolving 5 grammes of yellow oxide of mercury in a warmed mixture of 20 mils of concentrated sulphuric acid and water. Warming on the water-bath causes a precipitation of an acetone-mercury sulphate of variable composition which must in each case be checked against a similar precipitate made from an acetone solution of known strength. *Methyl alcohol* is determined by first precipitating acetone as iodoform and then distilling an aliquot part of the filtrate, after the addition of small amounts of sodium thiosulphate and sodium hydroxide. From the density of the distillate the percentage of CH_3OH may be deduced. *Phenols* are determined by shaking out

100 mils of pyroligneous acid with benzene after adding 5 mils of sulphuric acid. The benzene solution is then shaken out with a definite quantity of 20 per cent. sodium hydroxide solution in a phenol measuring bulb and from the increase in the volume of the alkali solution, the amount of phenol is deduced.—J. Am. Pharm. Assoc., 5 (1916), 716.

Saccharin.—*Determination in Food Stuffs.*—By the method given by M. Kolstermann and K. Scholta, saccharin is obtained by shaking out with a mixture of ether and petroleum ether from acid solution and the solvent evaporated in a flask. The residue is boiled a few minutes with 10 per cent. hydrochloric acid and the solution evaporated in a dish on a water-bath to dryness. If the odor of vanillin is obtained the residue is extracted several times in the cold with 10 mils of a mixture of equal parts ether and chloroform till the odor has disappeared. In the absence of vanillin a part of the hydrochloric acid residue is tested with Nessler's reagent. A negative result of this test indicates the absence of saccharin and further testing is unnecessary. If the test is positive, the hydrochloric acid residue is dissolved in some phenol and dropped on phosphorus pentoxide in a porcelain crucible. The formation of a red dye soluble in water with a yellow color and turning bluish red on addition of alkali indicates the presence of saccharin. For confirmation a few drops of ammonium sulphide may be added; the color must not immediately disappear.—Z. Nahr. Genussm.; through Pharm. Ztg., 61 (1916), 245. (J. H. W.)

Salicylic Acid.—*Melting Point of.*—H. L. Smith finds that samples of salicylic acid obtained from a number of sources and carefully purified gave a melting point of 158.5°, which is distinctly higher than the figures usually given. He finds the addition of parahydroxybenzoic acid lowers the melting point; the presence of 1 per cent. of the para acid producing a melting point of 155° to 156°, while a 10 per cent. admixture melts at 146° to 147°. Five per cent. of the para acid can be detected microscopically but for the detection of a 1 per cent. admixture the following test should be used: To the suspected sample, add lime water and water. Then evaporate to dryness, heat to 110° for 1 hour and after cooling extract with a little water. Acidulate this solution (which contains all of the calcium salt of the para acid and not so much of the salicylic acid), shake out with ether and examine the

ether residue microscopically, salicylic acid crystals separating in feathery or leaf-like groups, the para acid, in small dense tufts. —Analyst; through Chem. Abstracts, 10 (1916), 800.

Methyl Salicylate.—*Influence on Production of Bile.*—G. Leone's experimental work on a guinea pig has apparently established that this drug has the power to increase materially the amounts of bile secreted and of its total solid residue.—Riforma Medica; through J. Am. Med. Assoc., 67 (1916), 1403. (W. A. P.)

Strophanthic Acid.—*Characteristics.*—Sieburg has isolated from the mother liquor obtained in the manufacturing of *g*-strophanthin, the glucoside of Strophanthus gratus, a glucosidal acid, which has been named strophanthic acid. The acid forms strongly foaming solutions with alkalies, and is precipitated from such solutions by phosphotungstic acid, phosphomolybdic acid and picric acid, but not by tannic acid. Nessler's reagent produces in the cold a yellow color, which turns to blood-red on warming; on boiling the mixture a grayish brown precipitate is produced. On hydrolysis strophanthic acid is split up into glucose and strophanthigenin. The latter forms, when recrystallized from alcohol, small white needles, aggregated to rosettes, which melt at 294°.—Ber. pharm. Ges.; through Drug. Circ., 60 (1916), 83.

Ammonium Sulphocyanide.—*Toxicity.*—Vintelesco and Popesco recently met with an instance in which death followed the taking with suicidal intent of a considerable amount of ammonium sulphocyanide. The dose swallowed could not be determined, since only a bottle labelled "Ammonium rhodanatum 100 Gm.," still containing a few crystals of the salt, was found. When admitted to the hospital the patient was delirious and convulsive. Unconsciousness supervened, and death ensued in forty hours. Precise information as to the nature of the poison not being available, toxicological examination was necessary. Hydrocyanic acid was first sought for and not found. On acidifying a portion of the material with sulphuric acid, and distilling, the distillate gave the intense red color with ferric chloride characteristic of sulphocyanic acid. The same reaction was then obtained directly from the purified aqueous extract of the viscera. A rabbit treated hypodermically with 2.5 Gm. of ammonium sulphocyanide died in half an hour without displaying any special symptoms. Sulphocyanide was recovered from all its organs and in the blood. The latter did not show any spectroscopic differences from normal blood.—Ann. d'hygiene et med. leg.; through Pharm. J., 97 (1916), 181.

Isosulphocyanides.—*Sensitive Reaction.*—G. Denigès employs a test depending on the fact that when a solution of an isosulphocyanide is boiled with mercuric sulphate solution dithiomercuric sulphate is formed, which is very insoluble. The reaction may be represented by the equation

$$2CSNK + 3SO_4Hg + 4H_2O = S_2Hg_3SO_4 + 2CO_2 + 2NH_3 + 2KHSO_4.$$

A few mils of the solution to be tested are treated with twice its volume of mercuric sulphate reagent (mercuric oxide, 5 Gm.; sulphuric acid, 20 mils; water to 100 mils). After agitation the mixture is filtered, if necessary, and then heated to boiling for one minute. In the presence of the isosulphocyanides a turbidity at first forms, and ultimately a crystalline precipitate. The test will detect 0.25 of isosulphocyanic acid in 1,000. Salts of barium, strontium, and calcium, which are precipitated by sulphates, do not interfere, since they are removed by the first filtration before boiling. The crystalline precipitate has a definite microscopical character, which serves for confirmatory identification.—Ann. chim. anal.; through Pharm. J., 96 (1916), 193.

Tartrates.—*Effect in Nephritis.*—While the vegetable acids, such as citrates, burn to alkali in the body, the tartrates are not so converted, and leave the body nearly in their original form. Underhill and others have shown that tartrates in large doses can cause tubular nephritis in animals. While human beings tolerate without apparent kidney disturbance small doses of tartrates, either given medicinally or as they occur in baking powders and in certain foods, and while it would probably require very large doses to cause kidney inflammation, it would seem inadvisable to give food rich in tartrates or to give medicinally large doses of tartrates in nephritis.—J. Am. Med. Assoc., 67 (1916), 1601. (W. A. P.)

ALKALOIDS.

Alkaloidal Affinity of Hydrous Aluminum Silicate.—*Discovery.*—In this paper John Uri Lloyd has given a brief but comprehensive history of his experiments with various kinds of clay in reference to their affinity for alkaloids. Its purpose is to make accessible to future investigators such data as may be necessary to facilitate research work along these lines, and was written largely to answer

the numerous questions which have been brought to the writer ever since he made his discovery. The paper abounds in useful information, and is written in the inimitable style so well known by readers of pharmaceutical literature. To be appreciated and understood it must be read in the original as an abstract could not do the subject justice.—J. Am. Pharm. Assoc., 5 (1916), 381 and 490. (L. S.)

Alkaloids.—*Assay in Forensic Analyses.*—The experiments of A. Cardosa Pereira in conjunction with Cordeiro Casqueiro have shown that it is possible in alkaloid determinations to free the residues of the ether and chloroform extractions completely of ptomaines by the use of perhydrol even when working with highly putrefied brain masses. The aqueous tartaric acid solution first shaken out with ether according to the method of Otto is separated from the ether, made alkaline with sodium hydroxide, decomposed with a few mils of perhydrol, the mixture heated for a few minutes to boiling, allowed to cool and the analysis continued in the usual manner. The residues, which before the purification showed large precipitates with the ordinary alkaloidal reagents, after that were perfectly clean whether ether or chloroform had been used. In the same manner the acid ether residue could also be completely purified. Of course, possible changes of the alkaloids by the perhydrol must be taken into consideration.—Chem.-Ztg.; through Pharm. Ztg., 61 (1916), 108. (J. H. W.)

Alkaloidal Assays.—*Some New Drug Determinations.*—The following new assay methods for some drugs are given by van Itallie:

Belladonna Leaves. Fifteen grammes of the powdered leaves are shaken with 95 Gm. of diluted alcohol continuously for one hour. The mixture is then filtered and 50 Gm. of the filtrate, equivalent to 7.5 Gm. of the drug, are evaporated until about 10 Gm. remain. To this 10 drops of diluted sulphuric acid and sufficient water are added to obtain a total weight of 15.2 Gm. The mixture is then filtered and 12 Gm. of the filtrate, equal to 6 Gm. of the drug, are shaken out with 60 mils of ether and 4 mils of ammonia water. After the addition of tragacanth, the mixture is shaken again, 50 mils of the ethereal liquid are filtered off and evaporated to dryness. The residue is dissolved in 5 mils of alcohol, the solution diluted with 5 mils of water and titrated with N/100 acid, using methyl orange as indicator.

Pomegranate Bark. Seven grammes of the bark are shaken for one-half hour with 70 mils of ether and 7 mils of caustic soda solu-

tion. The ethereal liquid is filtered through a funnel provided with a plug of cotton, is then shaken out with one mil of water and filtered. Fifty mils of the filtrate are titrated with N/40 hydrochloric acid with methyl orange as indicator. Each mil of acid corresponds to 3.675 Mgm. of alkaloids.

Extract of Pomegranate. This extract (2.5 Gm.) is intimately mixed with 1 Gm. of magnesium oxide, the mixture transferred to a 125 mil flask and shaken for one-half hour with 75 mils of ether and 10 mils of caustic soda solution. The ethereal liquid is then decanted as much as possible and shaken out twice with one mil of water. Sixty mils are then filtered off and titrated as given above.

Cinchona. Three Gm. of the powdered bark are mixed with 1 Gm. of slaked lime and 3 mils of ammonia water until a uniform mass is obtained, which is transferred to a bottle and shaken at intervals for three hours with 60 mils of chloroform. The chloroformic liquid is then filtered through a dry filter and 50 mils, equal to 2.5 Gm. of bark, are evaporated, the residue dissolved in 20 mils of alcohol and after the addition of 20 mils of water titrated with N/10 hydrochloric acid using methyl red as indicator. Each mil of acid corresponds to 30.9 Mgm. of cinchona alkaloids.—Pharm. Weekblad, 53 (1916), 1661. (H. E.)

Alkaloidal Assays.—*Factors Influencing Separation by Immiscible Solvents.*—Beal and Lewis have published a masterly contribution to the problem of alkaloidal assays from the standpoint of the weakness of the ordinary methods of separation by immiscible solvents. After citing previous work on the subject showing that some of the sources of error are (*a*) solubility of the alkaloidal salt in the organic solvent; (*b*) possible hydrolysis of the salt into free alkaloid by action of water; (*c*) sparing solubility of the alkaloid in the organic solvent; (*d*) slow solubility of the alkaloid in diluted acid, the authors take up each problem and report their findings at length.

Previous investigators having studied the behavior of alkaloidal chlorides and sulphates, Beal and Lewis first attacked the problem from the standpoint of the tartrates preparing a number of tartaric acid salts of the alkaloids. Their work in determining how much less occurred in the "shaking out" process is presented in 12 tables and their conclusions are: (*a*) that neutral sulphates and tartrates in aqueous solution are hydrolyzed to a certain extent; (*b*) that with increase of acidity, hydrolysis becomes less; (*c*) that many

acid sulphates and tartrates are slightly soluble in chloroform and ether; (*d*) that the alkaloidal hydrochlorides tend to be quite soluble in chloroform. For the peculiarities of the individual alkaloids, the reader is referred to the original paper.—J. Am. Pharm. Assoc., 5 (1916), 812.

Alkaloidal Assay.—*Hydrochloride Method of.*—Beal and Brady have devised an assay method in which the purified ether extract of the alkaloid is treated with gaseous hydrochloric acid. Upon evaporation of the ether the hydrochloride is left behind, partly as a crystalline solid, partly as an oil. Heating on a water-bath, the crystalline hydrochloride was left behind and this was weighed, after which it was dissolved in water and titrated with standard alkali and from the amount of alkali used the amount of combined hydrochloric acid (and of the alkaloid) may be deduced, thus affording a check on the gravimetric figures.

By this method a sample of conium gave gravimetrically 1.74, 1.72 and 1.725 per cent. coniine, by titration 1.67, 1.67 and 1.70 per cent. and by the U. S. P. method 1.73, 1.72, and 1.74 per cent. A sample of colchicum root gave gravimetrically 2.22 and 2.30 per cent. of colchicine, volumetrically 2.19 and 2.28 per cent. and by the U. S. P. method 2.25 and 2.28 per cent.; while a sample of tobacco gave gravimetrically 2.65 and 2.61 per cent. of nicotine, volumetrically 2.66 and 2.49 per cent. and by Kisslings' method of assay 2.64 and 2.67 per cent.—J. Ind. Eng. Chem., 8 (1916), 48.

Alkaloidal Assays.—*Residues Should Be Treated with Ether Prior to Drying.*—If alkaloidal residues obtained by shaking out with chloroform are dried to constant weight, discordant results are obtained due to the tenacious adhering of the chloroform to the residue. To such a chloroform extract, ether should always be added prior to drying to constant weight. So reported Vanderkleed and E'we, at the meeting of the Pennsylvania Pharmaceutical Association.—J. Am. Pharm. Assoc., 5 (1916), 713.

Alkaloids.—*Detection with Sulphotitanic Reagent.*—Peset and Buendia find that the best color reactions for alkaloids is obtained by the use of a 1 per cent. solution of titanic acid in sulphuric acid. This reagent gives no color with aconitine, atropine, brucine, caffeine, cantharidin, cinchonine, cocaine, sparteine, hyoscyamine, hyoscine, pilocarpine no theobromine; it gives a rose or red color with codeine, curarine, delphinine, digitalin, emetine, hydrastine, nicotine and veratine; a blue to violet color with aspidospermine,

heroine, lobeline, morphine and papaverine; a green color with berberine, digitoxin and ergotinine; and a yellow color with eserine, cinchonamine, strychnine, narceine, picrotoxin, quinine and podophyllotoxin. — Anales soc. espan. fisica quimica; through J. pharm. chim., 14 (1916), 86.

Mydriatic Alkaloids.—*Tests for.*—R. Eder states that no single test is sufficient to identify a given mydriatic alkaloid. Physiological testing, Vitali's reaction, negative color tests with Froehde's and Erdmann's reagents, Wasicky's test and Arnold's reaction should all be given consideration. Of the microchemical tests, microsublimation, the iodine-atropine compound and the bromine reactions are found most servicable.—Schweiz. Apoth. Ztg., 54 (1916), 501, 517, 534, 544, 560, 609, 621, 657, 669, 685 and 717; through Chem. Abstracts, 10 (1916), 867.

Natural Alkaloids.—*Improvement of.*—Georg Cohn describes further advances in the improving of natural alkaloids by changing accompanying alkaloids of low value into useful medicinal compounds, the elimination of unpleasant or harmful side actions without influencing the principal effect of the alkaloids, the obtaining of new physiological effects, and the combination of one alkaloid with others in order to obtain valuable medicinal compounds. He discusses the groups of the quinine, opium, coca, solonaceous, and berberis alkaloids, referring largely to the patent literature and Merck's Jahresbericht. Insofar as is necessary descriptions of the earlier described preparation are amplified.—Pharm. Zentralhalle, 57 (1916), 299, 342, 375, 411, 431, 462, 510, 546, 577 and 604; through Chem. Abstracts.

Official Alkaloids.—*Their Isolation and Constitution.*—H. H. Slack in an article on the alkaloids and alkaloidal salts of the British Pharmacopœia undertakes to simplify, by classification into seven groups, the necessary information for students preparing for the major examination. The methods of isolation from the crude drugs are given in a simple, concise manner. When a group has only one official representative, its chemical formula together with some explanatory notes are given, *e. g.*, aconite of the aconine group, pilocarpine of the glyoxaline group and caffeine of the purine group. For the phenanthrene group represented by morphine, apomorphine, codeine and diamorphine he not only gives the structural formulæ but shows the relation of each to the others. A similar method is followed for atropine, hyoscyamine, hyoscine,

cocaine and homatropine representing the pyrrolidine group. In the instances where the alkaloids have been prepared synthetically Mr. Slack shows the most important of these steps, assisting very much in the student's understanding of the constitution of those particular alkaloids. The quinoline group is represented by quinine and strychnine. The author directs attention to the constitution of cinchonine, accepting König's formula. For strychnine he thinks it sufficient to know that although containing two atoms of nitrogen, it is a mon-acid base.

In the unclassified division he places physostigmine and pelletierine though giving some reasons why the latter may belong in the pyrrolidine group.—Pharm. J., 96 (1916), 71. (Z. M. C.)

Opium Alkaloids.—*Effect on Respiration.*—D. I. Macht has reinvestigated the effect of opium alkaloids on respiration. He divides the alkaloids of opium in two classes: In the one class is morphine, the prominent sedative alkaloid, which may not interfere with efficient respiration when the dose of the drug is small. In contrast with this are narcotine, papaverine, narceine, thebaine and cryptopine, all of which are stimulants and in large doses are excitants of the respiratory center. Codeine belongs to the morphine class, though in large doses it may also excite the respiratory center. The action of mixtures of opium alkaloids is a summation of their individual effects. It thus appears that if the object sought is a reduction of the labored activity of the respiratory muscles in a given case, the drug opium itself or mixtures of its alkaloids are to be preferred to morphine alone. If, on the other hand, it is desired to diminish the excitability of the cough reflex mechanism, it seems that a simple substance, as morphine or codeine, is to be preferred.—J. Am. Med. Assoc., 66 (1916), 514. (W. A. P.)

Acetanilide.—*Reactions.*—Broeksmit compares the reactions of acetanilide, phenacetine and pyramidon, and similar chemicals. The well-known indophenol reaction of acetanilide is produced with phenacetine also. The ruby-red coloration produced with phenacetine by hydrochloric acid and chromic acid is not given by acetanilide, which produces with these reagents a bluish green color. Pyramidon can easily be detected by the violet color which is produced when it is treated with sodium nitrite and diluted acetic acid. Antipyrine gives under the same conditions a bluish green color. Acetanilide, salipyrine, phenacetine and aspirin do not react with sodium nitrite, and acetic acid and pyramidon can

therefore easily be detected in mixtures with these substances. A violet color is given with diluted pyramidon solutions and alcoholic iodine solution, diluted ferric chloride solution, sodium hypochlorite solution, and with sodium persulphate in the presence of acetic acid.—Pharm. Weekblad; through Drug. Circ., 60 (1916), 86.

Acetanilide Mixtures.—*Detection of Salol in.*—B. Salkover assays mixtures of salol with acetanilide or with acetphenetidine by extracting the tablet (in finely divided form) or powder with chloroform, in which all three chemicals are freely soluble. Another portion of the mixture is extracted with petroleum ether (b. p. 40° to 45°) in which salol is easily soluble whereas the other two chemicals are very slightly soluble, 100 parts dissolving only 0.015 Gm. acetphenetidine and 0.022 Gm. acetanilide. From the weight of the chemicals extracted by chloroform subtract the weight of the salol extracted by petroleum ether and the difference is the amount of the other chemical.—Am. J. Pharm., 88 (1916), 484.

Aconitine.—*Forensic Determination.*—O. Tunmann publishes a series of articles dealing with the microchemical investigation of drugs, medicines, etc., from the toxicological standpoint. The first article discusses the detection of alkaloids, especially aconitine, in toxicological cases. It appears that aconitine may be positively identified by microchemical means when present pure, and also from the residues of the forensic analysis by the Stasz-Otto method. Only with the powder of the drug (root) has it been impossible up to date to obtain useful microchemical results on the object glass. In cases of poisoning with the root, therefore, it is necessary first to isolate the alkaloid.—Pharm. Ztg., 60 (1916), 49. (J. H. W.)

Adrenaline.—*Color Reaction.*—When an aqueous solution of adrenaline or an aqueous extract of the suprarenal gland is mixed with dichromate solution a red color is produced, and after allowing the mixture to stand for some time a dark brown precipitate separates, which, according to Ogata, consists of chromium dioxide. The reaction is given by pyrocatechuic acid also.—Yakugakuzasshi; through Drug. Circ., 60 (1916), 701.

Antipyrine.—*Assay of.*—Finding the assay method of the French Codex inaccurate, M. Francois has devised a process based on its titration with alcoholic iodine solution, in the presence of mercuric chloride.—Ann. fals., 9 (1916), 459; through Chem. Abstracts (1917).

Antipyrine.—*Incompatibility with Sodium Salicylate and Magnesium Sulphate.*—A solution of 0.36 gramme of antipyrine, 10.8 grammes of sodium salicylate and 28.8 grammes of magnesium sulphate in 240 mils of water, when set aside for some time, deposits a crystalline body, consisting of 55 per cent. of antipyrine, 40.1 per cent. of salicylic acid and 3.5 per cent. of magnesium. At 138° C. the crystals liquefied with decomposition. H. Finnemore and J. A. Colverd produced the same crystals by interaction between 2 molecules of antipyrine, and 1 molecule of magnesium salicylate. The crystals are white, readily soluble in hot water, but sparingly soluble in cold water. The aqueous solution fluoresces similar to that of a quinine salt, but to a lesser degree.—C. U. C. P. Al. J., 23 (1916), 187. (G. C. D.)

Atropine.—*Odor Test of the Swiss Pharmacopœia.*—R. Zellweger and R. Eder state that the orange flower odor produced when atropine is heated with chromium trioxide can be obtained by heating the alkaloid without the chromium compound. They therefore suggest simple heating of the alkaloid or its compounds in a small blast flame, until white fumes appear.—Schweiz. Apoth. Ztg., 54 (1916), 612 and 718; through Chem. Abstracts (1917).

Atropine.—*Production from Philippine Datura.*—It is reported from Manila that it has been ascertained that Datura alba, which grows in abundance in almost every part of the Philippine Islands, may afford a favorable commercial source of atropine and hyoscyamine. The plant grows wild practically everywhere, and in some localities reaches a height of six feet. At present no use is made of it. An American firm, to whom samples of the plant were sent, has recently ordered a large quantity of the dried leaves. At present, there is no attempt at cultivation or even systematic collection of the drug.—Oil, Paint, Drug Rep.; through Pharm. J., 97 (1916), 297.

Beta-Eucaine.—*Toxicity.*—T. G. Orr reports a case of beta-eucaine poisoning. Toxic symptoms appeared after an operation in which 3 ounces of a 0.25 per cent. beta-eucaine hydrochloride were used for the local anesthesia. After the toxic symptoms had completely disappeared, the patient died suddenly five days later. Necropsy showed an embolus in the left coronary artery.—J. Am. Med. Assoc., 66 (1916), 1857. (W. A. P.)

Codeine.—*Precipitation with Ammonia.*—William Duncan objects to the statement made in the last British Pharmacopœia that a 5 per cent. codeine phosphate solution does not precipitate on addition of solution of ammonia. He claims that the precipitation is so pronounced that it is difficult to understand how it escaped observation. He also regrets the use of the indefinite phrase, "acidified with hydrochloric acid," since he finds that with hydrochloric acid of certain strengths, the solution of the phosphate cannot be effected.—Pharm. J., 96 (1916), 352.

Colchicine.—*Characteristics.*—Particulars concerning pure colchicine, which he has prepared, are published by E. Merck. It forms nearly white, amorphous and inodorous plates, which have no sharp melting point. Dried over sulphuric acid, it becomes soft at 142° C., and melts at 147° C. It is soluble in water, alcohol, chloroform, and benzol, but is nearly insoluble in ether. When 1 part of colchicine is dissolved in 3 parts of water and the solution is put aside for some time, large, glittering, yellowish rhombic conglomerates of crystals are formed which consist of $C_{22}H_{25}NO_6.1^1/_2H_2O$. These crystals are only soluble in 70 parts of water, but easily soluble in alcohol and chloroform. They can quite easily be transformed into the amorphous form again. The formula for the crystallized colchicine is bimolecular, *viz.*, $(C_{22}H_{25}NO_6)_23H_2O$. Two crystallized compounds of colchicine and chloroform were obtained: (1) $C_{22}H_{25}NO_6 + CHCl_3$; this form occurs in white, glittering needles, which lose the chloroform at about 100° C. (2) $(C_{22}H_{25}NO_6)_2CHCl_3$, which forms fine needles united into rosettes. A crystallized ether-colchicine, easily soluble in alcohol, benzol and chloroform was also obtained. The chloroform-colchicine which Merck is marketing contains 14 to 16 per cent. of chloroform.—Chem. and Drug., 88 (1916), 946. (K. S. B.)

Colchicine.—*The U. S. P. Requirements for.*—Vanderkleed and E'we discuss the requirements for this alkaloid as given in the eighth and ninth revisions of the Pharmacopœia. They point out that most colchicine of commerce contains chloroform of crystallization, hence the requirement of U. S. P. IX that it should not lose more than 5 per cent. upon heating. They criticise the hydrochloric acid-ferric chloride-chloroform test of U. S. P. VIII, pointing out that the mixture should be boiled one to two minutes (guarding against excessive evaporation) if satisfactory results are to be obtained.—J. Am. Pharm. Assoc., 5 (1916), 716.

Cryptopine and Protopine.—*Study of Their Composition.*—In a 214 page article, W. H. Perkin discusses exhaustively these two rare alkaloids of opium, establishing the graphic formula of each body. No less than 202 derivatives of the two alkaloids were isolated, analyzed and studied during the research.—J. Chem. Soc., 109 (1916), 815.

Emetine.—*Cumulative Action.*—An investigation by H. H. Dale into the effects of the continued administration of emetine in individually harmless doses has afforded the author positive proof of the cumulative action of emetine, though the investigation is still only in its initial stage. The experiments have been conducted on cats and rabbits, but, taking into account the care needed in applying results thus obtained to human therapeutics, and allowing for differences in dosage and conditions, the author is convinced that the results are significant in indicating a serious danger in pushing the administration of emetine beyond a certain point; and his object is not to suggest any modification in the accepted dosage and rate of administration, but rather to reinforce the warning, which has already been sounded from other quarters, against the indiscriminate and unguarded use of emetine. Pathological investigation, as far as it has gone, indicates damage to the liver and kidneys, in addition to the expected signs of intestinal irritation.—Brit. Med. J.; through Pharm. J., 96 (1916), 47.

Emetine.—*Toxicity.*—Snell reports the death of a girl five years of age, to whom was given in all, 10.6 grains of emetine during a period of twenty-one days for amebic dysentery. A rash first appeared, followed by a neuritis and paralysis of the muscles of deglutition, the latter being the immediate cause of death.—China Med. J.; through Drug. Circ., 60 (1916), 339.

Emetine.—*Use in Pyorrhea.*—John S. Ruoff in a preliminary report on the curative effects of ipecac and emetine in pyorrhea alveolaris sums up results obtained at Fort Stanton Sanatorium.

Of 190 patients examined 187 showed endameba. The symptom of bleeding gums was the one most frequently affected by the emetine and ipecac, and always the first to disappear.

Out of 78 cases treated, 51 had always neglected their teeth; 34 (43.6 per cent.) were far-advanced cases of pyorrhea; all had tuberculosis in some stage, but mostly far advanced.

None of the 78 lost their endameba permanently. The condi-

tion of the gums and teeth was greatly improved in 3 cases, moderately improved in 9 cases, slightly improved in 22 cases; while 41 cases remained the same; the results were doubtful in 2 cases, and one case became worse. Practically all that were found negative for endameba at the conclusion of the injections were found positive for the endameba from two weeks to four months later, in spite of using a solution of ipecac as a mouth-wash. This leads to the conclusion that emetine is an amebicide, but alone will not cure pyorrhea alveolaris.

In outlining future work along this line, Surgeon Ruoff states that it appears to be necessary to revert to a degree at least to those painstaking and tedious operative procedures in the treatment of pyorrhea, the efficacy of which has long been known to dental surgeons. Future study is necessary to determine how much assistance can be expected from the ipecac preparations used in conjunction with operative measures.—Am. J. Pharm., 88 (1916), 164. (R. P. F.)

Emetine Hydrochloride.— *Variability.*—Two cases in which the administration of emetine hydrochloride produced symptoms of poisoning (one terminating fatally) at the Johns Hopkins Medical Clinic led to an investigation by R. L. Levy and L. G. Rowntree, in which the emetine hydrochloride preparations of five pharmaceutical houses were used. This investigation led to the conclusion that the products supplied as emetine hydrochloride are variable in composition and in toxicity to a degree which constitutes a serious danger. It behooves physicians to insist on some declaration from the firm supplying emetine hydrochloride as to its purity and as to the standard employed. Levy and Rowntree emphasize also the fact that emetine hydrochloride medication itself is not an innocuous procedure. To avoid the toxic effects of emetine the dosage should be carefully adjusted for each individual and the treatment should be given in courses at intervals of several days or a week. The subcutaneous method of administration is to be preferred.—Arch. Int. Med., 17 (1916), 420. (W. A. P.)

Eserine and Geneserine.—*Partial Synthesis.*—Polonovski and Nitzberg attempted the synthesis by heating eseroline with methyl isocyanate in a sealed tube without success. When the two substances reacted in the cold, molecule for molecule, a new compound was obtained, but not eserine. The authors then tried the effect of introducing traces of sodium, and they found that when CH_3CNO is heated in benzene with eseroline in a sealed tube, and

in presence of traces of sodium, the product is synthetic eserine. Thus when a single molecule of CH_3CNO acts on a molecule of eseroline, according as pure eseroline or a specimen containing traces of sodium is used, the methylcarbaminic group can be fixed on the OH or the N of the eseroline, and an addition product is thus obtained which is either a urethane (eserine) or a urea (isoeserine). Geneseroline in similar conditions yields only geneserine, giving neither an addition product nor a ureic substance preserving a phenol function. This difference of behavior indicates that geneseroline does not possess the imide group which exists in eseroline.—Bull. soc. chim.; through Chem. News, 113 (1916), 120.

Epinephrine.—*Use in Nephritis.*—G. B. Borelli reports two cases of acute and one of chronic nephritis in which remarkable benefit was realized by epinephrine treatment. Ercolani called attention in 1910 to the benefit from epinephrine by the mouth in nephritis, commending the harmlessness, ease and efficacy of this method of treating kidney disease, which has proved its usefulness again and again, and Borelli's experience has confirmed his statements.—Policlinico; through Jour. Am. Med. Assoc., 66 (1916), 1895. (W. A. P.)

Ethylhydrocupreine.—*Danger in Use.*—G. H. Oliver says that the use of ethylhydrocupreine in pneumonia cases has disastrous effects upon the eye.—Brit. Med. J.; through Chem. and Drug., 88 (1916), 37. (K. S. B.)

Ethylhydrocupreine.—*Use in Measles, Scarlet Fever, Etc.*—Observations made by A. D. Hirschfelder and F. W. Schultz on scarlet fever gave negative results. Patients were treated with ethylhydrocupreine, in capsules, in doses of 0.1 to 0.5 Gm., three times a day, according to the age of the patient. In the seven treated cases, the fever and acute symptoms showed an average duration of nine days, while in the seven untreated cases occurring at the same time, the average duration was 7.4 days. Eleven unselected cases of measles were treated and showed an average duration of 4.3 days, while among ten unselected cases occurring under the same circumstances the average duration was eight days. Moreover, all the treated cases were free from complications, while in the untreated there were six cases of severe complications among the sixteen consecutive cases.—Am. J. Diseases of Children; through Jour. Am. Med. Assoc., 66 (1916), 1579. (W. A. P.)

Hexamethylenamine. — *Preparation in the Pharmacy.* — S. Markussen places into a tared, enamelled dish 2000 Gm. formaldehyde solution and adds with stirring 2800 Gm. 10 per cent. ammonia water, or (in small portions at a time, to avoid explosive heating) 1100 Gm. 25 per cent. ammonia water. The ammonia must be pure and free from pyridine otherwise a yellow to brown solution is obtained, making necessary a prolonged washing of the hexamethylenamine. The solution must smell distinctly of ammonia, otherwise more is added; it is then evaporated over a flame, with the occasional addition of ammonia to 2500 Gm., filtered if necessary and the evaporation continued to 800 Gm.

From 2000 Gm. formaldehyde solution, 560 Gm. hexamethylenetetramine are theoretically obtained; this, however, being readily soluble (1 part in 1.5 parts water) 160 Gm. remain in solution and, at the most, 400 Gm. yield is obtained. The crystals are filtered off with suction and washed with about 250 Gm. 96 per cent. alcohol till the latter runs off colorless and a test portion of the hexamethylenamine dissolved in 20 parts water gives no reaction with Nessler's reagent. The crystals are then dried on filter paper at room temperature.

The mother liquor is more or less yellow colored; the alcohol is distilled off, the remainder diluted with an equal volume of water, 10 Gm. good blood charcoal (Merck's Carbo animalis ad usum internum) added, and the added water evaporated. The filtered colorless solution contains ammonium formate from the formic acid of the formaldehyde solution and is employed in the next batch.

The hexamethylenamine obtained is a snowy-white crystalline powder and meets completely all the requirements of the Pharmacopœia.—Farm. Tidende; through Apoth. Ztg., 31 (1916), 79. (J. H. W.)

Hexamethylenamine.—*Tests for.*—P. Carles summarizes the tests for identity and for purity of this chemical. He points out that while it is entirely volatile if heated cautiously and at intervals, if it is suddenly and strongly heated it yields a black nonvolatile residue.—J. pharm. chim., 13 (1916), 279.

Hexamethylenamine.— *Use in Poliomyelitis.*—It has been shown that hexamethylenamine has no germicidal activities, except in an acid medium. Therefore, it is of special value only in infections of the pelvis, of the kidney, ureters, bladder and urethra when the

urine is acid. It cannot be expected to exert germicidal activity in the spinal fluid, which is alkaline and hence is of no value in the treatment of anterior poliomyelitis.—J. Am. Med. Assoc., 67 (1917), 309. (W. A. P.)

Hexamethylenamine.— *Value as Uric Acid Solvent.*—H. D. Haskins reports that while the administration of excessive doses of hexamethylenamine may produce a slight solvent action on uric acid, the required dose is too large and an equal or better effect can be produced by administration of alkaline diuretics or of sodium bicarbonate in reasonable quantities.—J. Am. Med. Assoc., 66 (1916), 962. (W. A. P.)

Histidine.—*A New Method of Synthesis.*—In a paper by F. L. Pyman, a new method for the synthesis of histidine is given. Hydroxymethylglyoxaline is oxidized to glyoxalineformaldehyde, which condenses with hippuric acid, in the presence of sodium acetate and acetic anhydride, yielding 2-phenyl-4(1-acetylglyoxaline-4 (or -5)-methylidine)-oxazolone, which upon hydrolysis yields α-benzoylamino-β-glyoxaline-4 (or -5)-acrylic acid. The latter is reduced to benzoyl-*r*-histidine, from which *r*-histidine is obtained by the action of boiling hydrochloric acid. The author has also combined glyoxalineformaldehyde with HCN, giving a cyanohydrin which upon reduction yields β-hydroxy-β-glyoxaline-4 (or -5)-ethylamine. This latter is of interest as it contains an ethanolamine grouping similar to that in adrenaline. In physiological properties, however, it is less active than aminoethylglyoxaline iminazolylethylamine.—Chem. and Drug., 88 (1916), 165. (K. S. B.)

Kryptonine.—*A New Alkaloid of Ipecac.*—J. U. Lloyd describes this amorphous alkaloid found in small amounts in ipecac. Three batches (125 pounds each) of ipecac yielded, respectively, 112.4, 107 and 120 grammes of the alkaloid, which has the formula $C_{29}H_{40}N_2O_9$. It is yellow in minute colloidal precipitate, black in mass, soluble in water, alcohol, chloroform, glycerin, diluted acids and dilute alkalies, insoluble in ether and benzene and gives in solution definite reactions with alkaloidal precipitants. It is extracted from ipecac by making an acidulated infusion of the drug, removal of the alkaloids from the infusion by use of Lloyd's reagent, extracting the alkaloids from Lloyd's reagent by making alkaline and shaking out with chloroform, transferring the alkaloids from the chloroform with diluted acid, precipitation of the emetine

by addition of alkali, shaking the filtrate with chloroform and finally precipitating the kryptonine from the concentrated chloroform solution by pouring into an excess of ether.—J. Am. Pharm. Assoc., 5 (1916), 1061.

Morphine.—*Identification in Syrup.*—François and Luce give the following process for identifying morphine in syrup of morphine hydrochloride and similar preparations: Fifty grammes of the syrup are mixed with 50 mils of water, 20 grammes of sodium sulphate, 0.5 gramme of asbestos wool cut into pieces about one centimeter long and 50 mils of N/10 iodine solution. The mixture is shaken well and is allowed to stand for 30 minutes. It is then transferred to a funnel provided with a plug of cotton and the filtrate is returned to the funnel until it has become completely limpid. The asbestos to which the morphine periodide closely adheres is then gently pressed to remove as much of the liquid as possible. The periodide is then dissolved by adding to the asbestos drop by drop 20 mils of an acid solution of sodium bisulphite obtained by mixing 10 mils of a concentrated solution of sodium bisulphite with 90 mils of water and 10 drops of concentrated hydrochloric acid. The asbestos and cotton are washed with 20 mils of water, the combined liquids which contain the morphine in the form of hydroiodide are rendered neutral with ammonia water and after adding four drops of the alkali in excess are shaken vigorously for two minutes with 20 mils of amyl alcohol. When the layers have separated the aqueous liquid is drawn off, the amyl alcohol washed with 10 mils of water, which when completely separated is rejected, and from the amyl alcoholic solution the morphine is extracted with a slight excess of diluted hydrochloric acid, the acid solution is evaporated and to the residue the usual reagents for morphine are applied.—J. pharm. chim.; through Drug. Circ., 60 (1916), 338.

Morphine.—*Quantitative Determination in Galenicals.*—Debourdeaux calls attention to the fact that the presence of alcohol, starchy and other substances in extracts, powders, etc., will materially influence the correctness of the results obtained. He states that in order to completely precipitate morphine by means of the lime method a larger quantity of this will be required, if the liquid has not been previously freed from alcohol. In a mixture containing starch as well as alkaloid, the former will retard the complete precipitation of the latter by means of an alkali, and for this reason starch should first be removed. He also calls

attention that temperature errors are least between 15 and 18° C., and recommends that operations be conducted uniformly at a temperature of 15° C.—J. pharm. chim.; through C. U. C. P. Al. J., 23 (1916), 202.

Morphine and Codeine.—*Colorimetric Assay of.*—E. Carlinfanti determines minute quantities of morphine and codeine colorimetrically. For morphine, the solution is treated with concentrated sulphuric acid containing a trace of nitric acid, the red color produced being compared to solutions of morphine hydrochloride of known strength similarly treated. For codeine, the blue color produced by ferric chloride is employed as a basis of the assay.—Boll. chim. farm.; through Chem. Abstracts, 10 (1916), 1906.

Morphine and Codeine.—*Microchemical Distinction of.*—O. Tunmann finds that when treated with hydriodic acid these alkaloids yield crystals which have always the same forms and allow of differentiation of the 2 bases. A little of the salt of the base is sublimed by heating on an asbestos plate, covering the sublimate with a cover-glass, and introducing at the edge of this a drop of hydriodic acid. A slight granular precipitate is thus formed and this disappears on heating. On cooling, crystals of the tetraiodide are immediately formed in the case of morphine, whereas with codeine, crystals of the tri-iodide appear only after 3–5 minutes, but more rapidly in the presence of a drop of alcohol. The morphine tetraiodide crystals are always very flat, quadrangular,—mostly rectangular plates, 30–50 μ broad by 80–120 μ long, and are prismatic and show direct extinction and a blood-red to brownish red color. The bulk of the crystals are united to ladder- and step-like aggregates 1 Mm. or more long, and these in turn are combined to stars and crosses. Pleochroism is either slight or non-existent. Codeine tri-iodide crystals are paler, thicker and smaller, the aggregates being not more than $^1/_3$ the size of morphine tetraiodide. Single crystals (20–50 μ by 40–80 μ) are rare and form half-moon-like triangles with a concave base and a blunted apex. The majority are twin crystals, which always grow out on the convex side and give butterfly- and goblet-like forms, by which these crystals are recognizable at the first glance. Strong pleochroism exists in this case.—Apoth. Ztg., 31 (1916), 148; through Chem. Abstracts (1917).

Morphine and Heroine.—*Rapid Separation.*—The following method of separating these two bases when both are present in the same solution or tablet is offered by James M. Doran:

Take a sample representing not over 0.2 Gm. of either morphine or heroine. If a solid, dissolve in dilute hydrochloric acid; if a liquid, acidulate with hydrochloric acid, and evaporate off all alcohol before proceeding. Transfer the filtered acid liquid to a separator, make slightly alkaline with ammonia water, and shake out three times with carbon tetrachloride, using about 25 mils each time. Evaporate to dryness, heat for about ten minutes in an oven at 100° C., cool and weigh as heroine. The amount may be checked by dissolving in N/25 sulphuric acid and titrating with N/25 sodium hydroxide, using methyl red as indicator. The solubility of heroine in carbon tetrachloride is rapid, while the same solvent dissolves morphine very slowly, hence little if any of the latter is shaken out with the heroine. The aqueous liquid left after the extraction of the heroine is now shaken out with iso-butyl alcohol-chloroform (1 to 1) until free from morphine, the morphine solution is filtered, the chloroform distilled off at ordinary pressure, the isobutyl alcohol distilled off at reduced pressure, the morphine residue is dissolved in excess of N/25 sulphuric acid and the excess of acid is then titrated with N/25 sodium hydroxide, methyl red being used as indicator.—J. Am. Pharm. Assoc., 5 (1916), 163. (L. S.)

Novocaine.—*Pharmacology.*—According to R. A. Hatcher and C. Eggleston the toxicity of novocaine is greatest when a concentrated solution is injected rapidly into the vein, in which case a dose of 40 Mgm. per kilo is fatal to the cat and rabbit, and probably to other animals, though much smaller doses cause severe, and even threatening symptoms. Very much larger doses may be injected slowly into the vein or subcutaneously without causing more than temporary disturbances. The subcutaneous injection of a mixture of novocaine and epinephrine results in greatly delayed absorption and consequently diminished toxicity of the novocaine for the cat. When such a mixture is injected intravenously there is a synergistic constrictor action on the vessels, with an antagonistic effect on toxicity probably due to the action of epinephrine on the heart. The toxicity of novocaine is increased, but in a variable degree, by the previous administration of hydrated chloral which depresses the respiratory center. The extremes of toxicity of novocaine shown when it is injected rapidly into the vein of a

chloralized cat (10 Mgm. per kilogram, fatal) and when administered slowly to a normal cat (408 Mgm. per kilogram with only temporary disturbances) suggest a possible explanation of the accidents occasionally seen when small doses of novocaine are used clinically. —Journal of Pharmacology and Experimental Therapeutics; through J. Am. Med. Assoc., 67 (1916), 470. (W. A. P.)

Papaverine.—*Pharmacology of.*—Dr. D. J. Macht finds that the stimulating effect on the respiration, the remarkable analgesic power and other pharmacological properties of papaverine, coupled with its comparatively low toxicity, indicate its value in medicine. He expressed the hope that further observations of its therapeutic usefulness be carried out.—Arch. Int. Med.; through Am. J. Pharm., 88 (1916), 424.

Phenacetine Hydriodotetraiodide.—*Use in Detecting of Phenacetine in Mixtures.*—In a paper on organic periodides, W. O. Emery points out that "iodophenin" of Scholvien and Riedel is a mixture. Emery finds, however, that by modifying the proportion of ingredients a pure hydro-tetraiodide melting at 133–134° may be obtained. The reaction of manufacture may be utilized for the detection of phenacetine in admixtures and for its separation from acetanilide. One to two milligrammes of phenacetine (or an evaporated chloroform extract of an admixture) are treated with 1 drop of acetic acid, 0.5 mil of water and 1 mil of tenth-normal iodine, V. S. Warm the mixture to 40° and add one drop of concentrated hydrochloric acid. The periodide separates either as needle-like prisms or leaflets (if pure phenacetine) or as reddish brown leaflets or as oily globules eventually forming crystalline aggregates, if the mixture contains both phenacetine and acetanilide.—J. Am. Chem. Soc., 38 (1916), 140.

Pyridine.—*Detection of Minute Amounts in Galenicals.*—For the detection of denatured alcohol in galenicals through its pyridine content, H. Kunz-Krause recommends the following procedure. Ten mils of the suspected tincture are placed in a separatory funnel, made alkaline with sodium hydroxide solution added drop by drop, and are shaken with 10 to 15 mils of ether. The lower aqueous layer is removed, and the ether layer is cautiously shaken with 10 to 15 mils of water into which the alcohol and all of the pyridine pass from the ether layer. The aqueous layer is made distinctly alkaline, mixed with 10 per cent. copper sulphate solution and

is then heated on a water-bath to expel the alcohol and ether. If pyridine is present a characteristic blue-green precipitate of pyridine-copper sulphate results and on moistening this with sodium hydroxide solution, the blue cupric hydroxide precipitate and the characteristic pyridine odor ensue. If the use of ether is to be avoided, 10 mils of the tincture are "salted out" with an excess of potassium carbonate, the supernatant alcoholic liquid is filtered off, the alkaline filtrate is made acid with 10 per cent. copper sulphate solution and then the procedure given above is followed.—Apoth. Ztg., 31 (1916), 403; through Chem. Abstracts (1917).

Pyridine.—*Determination of.*—Malatester and Germain have found that cadmium chloride can be used for estimating pyridine quantitatively only when the liquid contains at least 90 per cent. of alcohol, as otherwise $CdCl_2.2C_6H_5N$, and not $CdCl_2.C_6H_5N$, is formed. The estimation is carried out by adding to an alcoholic solution of pyridine an excess of a standardized (about 4 per cent.) solution of cadmium chloride in 80 per cent. alcohol, allowing the mixture to stand for some time, filtering and estimating in the filtrate the excess of cadmium chloride with standardized silver nitrate solution.—Boll. chim. farm.; through Drug. Circ., 60 (1916), 20.

Quinine.—*Hypodermic Injection of.*—According to Lemoine a solution which may advantageously be used for the hypodermic injection of quinine consists of: basic quinine hydrochloride, 3 grains; urethane, $1^1/_2$ grains; distilled water 1 fluiddrachm. The solution will keep indefinitely. Subsequent pain can be relieved by the local application of heat. In place of the quinine dihydrochloride with urethane, quinine formate may be used in the same proportions.—Therap. Gaz.; through Meyer Bros. Drug., 37 (1916), 248.

Quinine.—*New Narcotic Compounds of.*—A patent (D. R. P. 291,421) has been taken out by Merck for the preparation of dialkyl-barbituric acids with derivatives of quinine, such as hydroquinine, ethyl-hydrocupreine, and propyl-hydrocupreine. Although stronger narcotics than the corresponding quinine derivatives, they are much less toxic, propyl-hydrocupreine-dipropyl-barbituric acid being practically non-poisonous.—Chem. and Drug., 88 (1916), 946. (K. S. B.)

Quinine.—*Use as Antiseptic.*—Taylor says that solutions of quinine are much more effective than solutions of the same strength of phenol in the treatment of gaseous gangrene. The American Ambulance Corps of Paris are accustomed to use one per cent. solutions of quinine hydrochloride in cases of gaseous gangrene, and even in the treatment of other infections.—L'Union Pharm.; through Drug. Circ., 60 (1916), 405.

Quinine.—*Use in Malaria.*—J. Dunbar-Brunton states that he has been greatly disappointed with the results of quinine treatment administered orally, and he refers to the already enfeebled stomach of a sufferer from malaria being still further deranged by quinine in powder thrown into it, and expected to put forth acid from its glands to dissolve the drug, which is surely too much to expect. A few grains may be absorbed, and the remainder passed through the pylorus interned in mucus and too inert to fight. The best way to administer quinine in such cases is by the intramuscular injection of quinine bichloride, which, the author states, is said to be liable to produce abscesses, though he has never found that to be the case in a long course of many injections. The essential part is to heat the ampuls of the solution over a flame till they are at blood heat. The usual precautions for injection are taken, and the injections are given deeply into the gluteal muscles, and no pain is felt afterwards, or alternatively under the shoulder blades between the muscles. Cures are effected in this way, and in all cases it gives better results than by intravenous injection. Possibly in the veins the quinine is carried too rapidly to the portal circulation, and possibly made inert. Intramuscularly the absorption goes on more slowly.—Brit. Med. J.; through Pharm. J., 96 (1916), 597.

Quinine and Aspirin.—*Formation of Quinotoxin.*—Replying to reports that quinine and aspirin have been largely used in combination without untoward results, W. L. Scoville states that the formation of quinotoxin is brought about when quinine is in contact with organic acids but mineral acids prevent the change. If the mixture is heated, the change from quinine to quinotoxin goes to completion within 24 hours. Below 100° C. the change proceeds more slowly and seemingly in ratio to temperature. When quinine sulphate and aspirin are in the dry form this change goes on very slowly. The water of crystallization in the quinine sulphate splits the aspirin into acetic and salicylic acids with the subsequent formation of quinotoxin. In liquid mixtures the reaction is more rapid.

It is quite likely that in freshly prepared mixtures all will be consumed by the patient before appreciable quantities of quinotoxin are formed. In the normal stomach, the hydrochloric acid will prevent its formation. Therefore, under ordinary circumstances no trouble is experienced. However, rash and nausea may follow the administration of the combination which might be considered symptoms of the disease because the formation and action of quinotoxin are frequently not well understood by the physician.

Quinotoxin is isomeric with quinine but has none of its therapeutic properties. It acts something like digitoxin and in toxic doses produces death by convulsions. Quinine in combination with organic acids other than those in aspirin are likely to cause nausea, skin rash and general discomfort.—Bull. Pharm., 30 (1916), 336. (C. M. S.)

Quinoidine.—*Use in Malaria.*—It appears that in India quinoidine is being used in large quantities in the treatment of malaria. It is not only effective but it is cheap. E. E. Waters says that it is an excellent prophylactic. For ordinary acute malaria and outpatient work 12 to 16 grains daily are generally sufficient. More may safely be given, especially in chronic and spleen cases; less is often effectual. It is important that a preliminary purge be administered.—Indian Medical Gazette; through J. Am. Med. Assoc., 67 (1916), 1401. (W. A. P.)

Scopolamine.—*Activity of Levo and Dextro Forms.*—Experiments conducted by Drs. Albert and Helen Leyton on the prevention of anaphylaxis in guinea pigs indicate that levo- and dextro-scopolamine are equally active on the central nervous system while only the dextro-scopolamine is effective on peripheral organs. This is contrary to the observations already upon record.—Chem. and Drug., 88 (1916), 1172. (K. S. B.)

Strychnine.—*Effects upon Quails and Squirrels.*—California quails have been found to be comparatively immune to strychnine sulphate, whereas ground squirrels are particularly susceptible.—Chem. and Drug., 88 (1916), 458. (K. S. B.)

Strychnine.—*Chemical and Therapeutic Action Masked by Quinine.*—E. Filippi finds that with a mixture of quinine sulphate and strychnine nitrate, in which the former preponderates, a characteristic reaction for strychnine cannot be obtained with the familiar sulphuric acid and potassium dichromate test. Crystals

of strychnine picrate precipitated from such a mixture are not characteristic. In presence of an excess of quinine, strychnine no longer gives the physiological reaction with the frog. Death ensues, but the symptoms are quite distinct from typical strychnine reactions. The only rapid and accurate method is to precipitate the quinine as tartrate with sodium potassium tartrate, and apply the tests for strychnine to the filtrate.—Arch. farm. sper.; through Pharm. J., 97 (1916), 593.

Thalleioquin Reaction.—A. Christensen finds that quinine, dihydroquinine, and substances obtained from quinine by saturation of the vinyl group, such as quinine dichloride and quinine oxychloride, all yield the green coloring matter known as thalleioquin, when slightly acid solutions are treated with chlorine water, followed by ammonia water. 5-Chloro-6-keto-cinchonine oxychloride, obtained by action of three molecules of chlorine upon quinine, forms thalleioquin upon addition of ammonia water alone. Upon drying, thalleioquin loses ammonia, forming 5,6-diketo-cinchonine hydrochloride, $C_{19}H_{21}O_3N_2Cl$, and must, therefore, be considered as a loose combination of this substance with ammonia.

5-Chloro-6-hydroxy-cinchonine oxychloride, $C_{19}H_{22}O_3N_2Cl_2$, formed by interaction of 2 molecules of chlorine with quinine, produces thalleioquin upon treatment with any oxidizing agent, plus a substance capable of combining with quinine and ammonia. 5-Chloro-6-hydroxyquinoline treated in a similar manner forms thalleioquinoline.—Ber. pharm. Ges.; through C. U. C. P. Al. J., 23 (1916), 86. (G. C. D.)

Thebaine.—*Structural Study.*—M. Freund and E. Speyer report on investigation results of phenyldihydrothebaine. The authors state that this compound may be regarded as having the same structure as the alkaloid itself. They, furthermore, claim that no aliphatic double bonds are present as is claimed by Knorr, arriving at this conclusion because of the fact that the compound resisted reduction by means of any of the ordinary methods, in both acid and alkaline solutions. In presence of colloidal palladium the absorption of one hydrogen molecule was noted; the resulting compound proved, however, to be a secondary base, $(C_{24}H_{25}O_3)NH.CH_3$, and was formed by the breaking of the nitrogen ring, and not by an addition because of a double linkage. It was, furthermore,

shown that the formation of dihalogen-phenyldihydrothebaine is surrounded by difficulties and that there are obvious structural changes.—C. U. C. P. Al. J., 23 (1916), 251. (G. C. D.)

Theobromine.—*Quality of Commercial.*—Commercial theobromine contains only about 90 to 94 per cent. of the pure alkaloids, according to investigations by Chevalier. From the mother liquids obtained from recrystallizing the commercial salt, caffeine, theophylline, adenine, xanthine, choline and small amounts of betaine were isolated. These impurities account for the by- and after-effects frequently obtained when administering commercial theobromine.—Bull. gén. therap.; through Drug. Circ., 60 (1916), 20.

Theobromine Sodium Salicylate.—M. Lefeldt calls attention that the 10 per cent. water content permitted by the German Pharmacopœia is too high. A 5 per cent. water content would be ample.—Pharm. Ztg.; through Chem. Abstracts, 10 (1916), 1773.

Veratrine.—*Combination with Chloral and Bromal.*—By mixing a carbon disulphide solution of veratrine with chloral two additive compounds were obtained by Frankforter and Kritchevsky. These have the formulæ $2(C_{32}H_{49}O_9N)CCl_3CHO$, melting at 220° C., and $2(C_{32}H_{49}O_9N)3(CCl_3CHO)$, melting at 209° C. Bromal yields a similar compound to the latter, and melts at 162° C. By heating to 140° C. for a few hours the whole of the chloral and bromal is expelled from these compounds.—Chem. and Drug., 88 (1916), 737. (K. S. B.)

Veronal.—*Toxicological Detection.*—W. Maradie succeeded in detecting the presence of veronal in the stomach and urine of a patient who was removed to a hospital in an unconscious condition. The stomach washings were acidified with hydrochloric acid and shaken out with ether. The residue was then treated with cold absolute alcohol, and after vaporization of the alcohol, treated with solution of sodium hydroxide. The treatment with ether and alcohol was repeated. The alcoholic solution treated with alcoholic potash developed the odor of ammonia. Treated with sulphuric acid, the odor of acetic and butyric acids developed. Another portion of the alcoholic solution vaporized to dryness, upon addition of Millon's reagent and nitric acid yielded a gelatinous precipitate, soluble in nitric acid, but insoluble in Millon's reagent. The color of the urine was orange-yellow, and contained neither albumin nor glucose. After acidulating, the urates were

precipitated by addition of calcium chloride, and the urine then treated with ether and absolute alcohol as before. The detection of veronal is accomplished as above described.—C. U. C. P. Al. J., 23 (1916), 87.

Vitamine.—*Preparation and Properties.*—R. R. Williams prepares vitamine from rice polishings as follows: Twenty-five kilos of the polishings are macerated with alcohol containing hydrochloric acid, the liquid then pressed out, concentrated under reduced pressure at a low temperature, and the aqueous portion separated from the layer of fat. The aqueous liquid is treated with phosphotungstic acid, the precipitate collected, washed with dilute sulphuric acid, air-dried, mixed with excess of barium hydroxide, and the mixture extracted with water; the extract is freed from barium and sulphuric acid, neutralized with nitric acid, concentrated under reduced pressure, and then treated with silver nitrate. The precipitated purine bases are separated, the solution treated with a further quantity of silver nitrate and an amount of barium hydroxide sufficient to produce a permanent precipitate; this is collected, decomposed with hydrogen sulphide, filtered, the barium present removed as sulphate, the solution concentrated and treated with twice its volume of alcohol. A precipitate forms which has slight curative properties when administered to fowls suffering from beri-beri; it contained a considerable quantity of nicotinic acid. The solution from this precipitate is evaporated over sulphuric acid at ordinary pressure; a small quantity of crystals forms on the surface of the liquid, the yield being about 35 Mgm. These crystals have a melting point of 223° C., and have pronounced curative powers. About 0.2 Gm. of amorphous material, having curative powers, also separates as the liquid is concentrated; when this is evaporated completely, a film weighing 0.25 Gm. is obtained, which has moderate curative powers. The effects of nicotinic acid and its derivatives on neuritic fowls were investigated. Nicotinic acid, trigonellin, and *p*-hydroxynicotinic acid effected little improvement; the hydrochloride of the methyl ester of nicotinic acid produced a marked but temporary improvement. —Philippine J. Sci.; through Pharm. J., 97 (1916), 545.

Vitamines.—*Their Use in Nutritional Diseases.*—A. Seidell, after discussing the importance of the presence of vitamines in food, describes his experiments in trying to find a suitable vitamine preparation for nutritional diseases, using as test animals, pigeons,

which when fed on polished rice develop polyneuritis, which seems the same disease as beri-beri in man.

Starting in with a fluid yeast extract, Seidell found that when this was given to pigeons along with an exclusive polished rice diet, the animals neither lost weight nor showed symptoms of polyneuritis in two months. Pigeons fed on polished rice without the yeast extract showed the paralytic symptoms of polyneuritis within twenty days. Such paralyzed pigeons when treated with the yeast extract recovered within 12 hours.

The only drawback to this yeast preparation came from the fact that if administered to man in effective doses at least 200 mils of the fluid would be needed. Attempts to concentrate this preparation were unsuccessful until the device of adsorbing the vitamines in the preparation by use of Lloyd's reagent was tried. This proved in every way successful and a vitamine concentrate was prepared that was effective in 0.05 Gm. doses for pigeons. This would mean about 5 Gm. a day for man. The paper gives detailed account of the preparation of fluid yeast extract and of the vitamine concentrate.—Am. J. Pharm., 88 (1916), 410.

Yohimbine.—*Relationship to Yohimbic Acid.*—L. Spiegel found that ammonia precipitates from the commercial yohimbine an alkaloid which when recrystallized from 50 per cent. alcohol yields a mother-liquid from which on evaporation crystals of a new base separate which is the methyl ester of yohimbine. He has named this product meso-yohimbine. It has the formula $C_{20}H_{23}O_2N_2$-$(OCH)_3$ and when recrystallized from alcohol or benzene it melts at 247°. It can be obtained from yohimbine by prolonged heating with alcohol and caustic potash and can easily be saponified to yohimbic acid. Meso-yohimbine possesses the same therapeutic action as yohimbine, but to a lesser degree. Spiegel also found that in some barks of Quebracho blanco, alkaloids of the yohimbine group and possibly yohimbine itself are present. The identity of quebrachine from quebracho blanco and yohimbine from yohimbe bark has not, however, been proven up to the present time.—Ber. pharm. Ges.; through Pharm. Weekblad, 53 (1916), 448. (H. E.)

GLUCOSIDES AND NEUTRAL PRINCIPLES.

Aesculin.—*Microchemistry of.*—O. Tunmann obtained 3.4 per cent. yield from finger-thick dried bark of the horse-chestnut, Aesculus hippocastanum. He obtained it in rhombic prisms melting at 161°, insoluble in acetic ether and in ether. He de-

tects it microchemically in the form of dibromesculin, which forms characteristic colorless radiating needle crystals melting at 194.5°. This compound is formed by warming aesculin with a potassium bromide solution containing 10 per cent. of bromine. The reaction can be applied to microscopic sections of the bark.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 10 (1916), 2500.

Cantharidin.—*Use in Galenicals.*—W. Hinz has conducted a series of investigations in order to determine whether cantharidin could be properly employed as a substitute for the various cantharidal preparations. As a result of his experiments he has arrived at the conclusion that pure cantharidin can be used advantageously in place of the corresponding amount of cantharidal collodion or cantharidal cerate. He suggests that the pure cantharidin be mixed with various ointment vehicles, so that the resulting ointment will contain from 0.01 Gm. to 0.02 Gm. in each 100 Gm.—C. U. C. P. Al. J., 23 (1916), 35. (G. C. D.)

Chrysarobin.—*Composition of Commercial.*—R. Eder reports on the scission of commercial chrysarobin. In his work, the following compounds were obtained:

1. A mixture of *triacetylemodin anthranol methyl ether* (m. p. 238°) and anthranol triacetyl chrysophanate (m. p. 236–237°).
2. *Diacetylemodin methyl ether* (m. p. 189–190°).
3. *Diacetyldehydroemodinanthranol methyl ether.*
4. *Dibenzoyldehydroemodinanthranol methyl ether* (m. p. 234–235°).
5. *Dibenzoylemodin methyl ether* (m. p. 232–234°).
6. *Tribenzoylemodinanthranol methyl ether* (m. p. 265–266°).
7. *Anthranol chrysophanate.*
8. *Emodinanthranol methyl ether.*
9. *Dehydroemodinanthranol methyl ether.*
10. *Diacetyl chrysophanic acid* (m. p. 208°).
11. *Anthranol tribenzoylchrysophanate* (m. p. 260°).

Chrysarobin may be considered as a mixture of compounds Nos. 7, 8, 9, along with emodin methyl ether and emodin anthranol. Eder could not find Jowett and Potter's dichrysarobin compounds, nor Hesse's chrysarobol. Of the constituents found by Tutin and Clewer, Eder finds only chrysophanic acid.—Arch. Pharm., 254 (1916); through Chem. Abstracts (1917).

Convallarin.—J. Lindner has examined convallarin of commerce. He finds it has the formula $C_{22}H_{40}O_{10}$ and not the formula ($C_{34}H_{62}O_{11}$) ascribed to it by its discoverer, Walz, in 1858. Hy-

drolysis yields hexose and convallaretin, which he finds has the formula $C_{19}H_{28}O_4$. It contains no ethylene bonds, no ketone nor methoxy groups, but it does possess two hydroxyl groups.—Monatsh.; through J. pharm. chim., 13 (1916), 290.

Crocetin.—*Microchemical Detection of.*—O. Tunmann reports on a number of compounds of crocetin giving characteristic crystals under the microscope. Among these are coniine-crocetin (yellow prismatic needles, 70 microns long) and aniline-crocetin (dark red polarizing spheroids, 70 microns long). Sodium-crocetin and potassium-crocetin crystals are also characteristic.—Apoth. Ztg., 31 (1916), 237; through Chem. Abstracts (1917).

Cymarin.—*Its Relation to the Other Heart Poisons.*—G. Trier gives an interesting summary of recent work done on cymarin, the active principle of Apocynum cannabinum by Windaus and Hermanns (Year Book, 1915, 369), by Impens and by Kuroda. Trier emphasizes the fact that there is a close relationship between the aglycone of cymarin (*cymarigenin*, $C_{23}H_{30}O_5H_2O$), strophanthidin, $C_{23}H_{32}O_6$, and digitaligenin, $C_{23}H_{30}O_3$. He also points out that the biose from the hydrolysis of cymarin (*cymarose*, $C_7H_{14}O_4$ or $CH_3.CHOH.CHOH.CHOH.CH_2.CH_2.CHO$) is a methyl ether of digitoxose (the hydrolysis product of digitoxin) and that there seems to be a close relationship between it and the hydrolysis product of strophanthin (methyl strophanthobiose, $C_{13}H_{24}O_{10}$).—Schweiz. Apoth. Ztg.; through J. pharm. chim., 13 (1916), 105.

Gentisin.—*Microchemistry of.*—O. Tunmann finds the best means of identifying gentisin is the microchemical testing of the sublimate with such reagents as sulphuric acid, nitric acid and monobromacetic acid, the resultant crystals being quite characteristic. The article also describes a new aliphatic alcohol (subliming at 180°) obtained from Gentiana purpurea-punctata and the yellow coloring matter of Frasera carolinensis.—Apoth. Ztg., 31 (1916), 181; through Chem. Abstracts (1917).

Glucosidal Synthesis.—*Influence of Acetic Acid on.*—Bourquelot and Aubry, having found that the presence of acetic acid hindered glucosidal synthesis, ran a series of parallel experiments with mixtures containing the same amount of glucose, methyl alcohol, distilled water and emulsin but added to each amounts of acetic acid ranging from 0.05 to 2 per cent. They found that more than 0.1 per cent. of acid hindered the synthesis and that in the 2 per cent.

acid mixture the synthesis was entirely stopped. They also found by experiment that the larger amounts of acid destroyed the emulsin.—J. pharm. chim., 14 (1916), 359.

Glucosidal Syntheses.—*Influence of Alcoholic Strength and Temperature on.*—M. A. Aubry reports results of his study on factors affecting glucosidal synthesis. Taking identical mixtures of galactose, yeast and water, he added methyl alcohol in various proportions and attempted his syntheses at ordinary temperature and at 30° C. He found that the methyl galactoside was best synthesized in a mixture containing from 20 to 30 per cent. of methyl alcohol; that elevated temperature materially lessened the synthesis; and that the ferment producing the galactosidal synthesis was more stable in the presence of methyl alcohol than was the glucosidal enzyme.—J. pharm. chim., 14 (1916), 289.

Synthetic Glucosides.—*Optical Rotation of.*—E. Bourquelot discusses the glycosides synthesized by him and the relationship existing between their structure and optical rotation. He tabulates his results as follows:

	Beta glucoside.	Beta-galactoside.	Alpha-glucoside.	Alpha-galactoside.
Methyl	—32.50°	— 0.419°	+157.90°	+197.70°
Ethyl	—35.80°	— 6.69°	+150.90°	+185.50°
Propyl	—38.68°	— 8.86°	+140.80°	+179.04°
Isobutyl	—39.18°	—11.23°	...	...
Allyl	—42.18°	—12.15°	+131.70°	...
Benzyl	—53.69°	—25.05°	...	...
Glycyl	—33.55°	±0°	+135.48°	+169.90°
Salicyl	—46.19°	—11.80°	...	...

The beta-glucosides and galactosides were prepared by combining the alcohol with glucose or galactose under the influence of emulsin; the alpha-glucosides and galactosides were synthesized by use of the yeast ferments as catalysts. It will be seen from the foregoing table that the galactosides are more dextrogyrate than are the corresponding glucosides and that each CH_2 group in a homologous series increases the levogyrate (or decreases the dextrogyrate) properties. The paper explains at length the structural difference between the alpha- and beta-glucosides and galactosides.—J. pharm. chim., 14 (1916), 225.

Glucosides.—*Biochemical Synthesis of Alpha-Propyldextrogalactoside.*—Bourquelot and Aubry have added alpha-propyldextrogalactoside to the long list of glucosidal substances formed by the prolonged action of ferments on alcohols and sugars under suitable conditions. The galactoside in question was obtained by the contact in an aqueous medium for eight months of galactose, normal propyl alcohol, and dried bottom yeast. When isolated, it crystallizes in lengthened, narrow, odorless, colorless, slightly bitter scales; very soluble in water, sparingly dissolved by absolute alcohol; melting in a capillary tube at 134° C.; $[\alpha]_D$ +179.04° at 21° C. It is readily hydrolyzed by dilute sulphuric acid, and also, but very slowly, by dextrogalactosidase of dry bottom yeast, the same ferment which brings about its synthesis.—Compt. rend.; through Pharm. J., 97 (1916), 413.

Glucosides.—*Biochemical Synthesis of Beta-Salicylgalactoside.*—Bourquelot and Aubry have obtained by synthesis β-salicylgalactoside, which is formed when a mixture of galactose, saligenin, acetone, and water are left in contact with emulsin for over ninety days. Although the new galactoside has not yet been obtained in a crystalline condition, some of its properties have been determined. It is levorotatory, $[\alpha]_D$ —11.3°. Its aqueous solution gives a red color reaction, with strong sulphuric acid. Like β-salicylglucoside, it gives a fine violet color with ferric chloride; salicin does not give this reaction. With the oxydase of a glycerin maceration of the fungus Russula delica, the aqueous solution becomes at first yellow, then brown. These two last reactions prove that the phenolic function is intact. On hydrolysis with dilute sulphuric acid, a resinoid precipitate of saliretin is formed. When emulsin is employed for the decomposition, the galactoside is split up into its original constituents, galactose and saligenin. Neither β-salicylgalactoside nor the corresponding β-glucoside has been prepared by purely chemical methods.—Compt. rend.; through Pharm. J., 97 (1916), 181.

Glucosides.—*Biochemical Synthesis of Alpha-Galactobiose.*—It was shown in 1913 that when concentrated solution of dextrose is left in contact with emulsin, α-glucobiose, identical with gentiobiose, is formed by the condensation of two molecules of the hexose. Bourquelot and Aubry now state that a similar biochemical action takes place when galactose is treated in the same manner. A new hexobiose, α-galactobiose, is slowly formed. It has been isolated, but has not yet been obtained in a crystalline condition.

It yields an osazone which, like the osazones of all the known reducing hexobioses, is soluble in boiling water. When purified, this osazone melts at 126.7° C. after slowly drying. In aqueous solution at 19° C., its $[\alpha]_D$ is +54.1°; in alcohol 90 per cent., +39.3°; in alcohol 40 per cent., +49.18°. Its optical activity is, therefore, markedly influenced by the alcoholic strength of the solvent. As in other cases of biochemical synthesis, the same ferment which effects the union of the molecules, under other conditions, causes their separation. Thus, in a weak aqueous solution of galactobiose, emulsin brings about complete hydrolysis, with liberation of galactose.—Compt. rend.; through Pharm. J., 97 (1916), 181.

Glucosides.—*Factors Affecting Syntheses with Alpha-Galactosidase.*—M. A. Aubry finds that the synthetizing activity of α-galactosidase of dried bottom yeast, in presence of methyl alcohol, attains its maximum when the alcoholic strength of the medium is between 20 and 30 per cent. w/v. Under such condition, 65 per cent. of the galactose present will eventually be combined to form α-methyl galactoside. If the proportion of methyl exceeds 40 per cent. w/v no synthesis will occur, and the enzyme will be very rapidly killed. Elevation of temperature augments in a notable manner the harmful effect of the alcohol on the ferment. Consequently during the experiment of bio-synthesis the temperature must not exceed 20 to 22° C. Yet the ferment may bring about the synthesis of galactose, and methyl alcohol is distinctly more stable towards that alcohol than α-glucosidase. This is, therefore, another indication that α-glucosidase and α-galactosidase are two distinct ferments, co-existent in bottom yeast. —J. pharm. chim.; through Pharm. J., 97 (1916), 593.

Hydrangenol.—*Characteristics.*—Some years ago Shimoyana isolated from Hydrangea hortensia a substance which occurred in the form of white, quadrangular, odorless and tasteless leaflets, and to which the formula $C_{19}H_{16}O_5$ was assigned. Asahima and Miyake have found that the product which was named hydrangenol has the formula $C_{15}H_{12}O_4$. It possesses both phenolic and lactone properties, being easily soluble in caustic alkalies, but reprecipitated from such solutions by carbonic acid. On boiling with caustic soda solution it is converted into its isomer, isohydrangenol, which occurs as pearly leaflets, melts at 181°, and like hydrangenol possesses two phenol hydroxyl groups yielding well-defined acetyl and benzoyl derivatives. Hydrangenol yields when treated with sodium and alcohol and acid, desoxyhydrangenolic acid, $C_{15}H_{14}O_4$,

which occurs as yellowish leaflets, which melt at 201–202°, and when boiled with hydrochloric acid yield carbon dioxide and a phenol, $C_{14}H_{14}O_2$, in the form of white needles melting at 108°. When fused with caustic potash, hydrangenol yields para-oxybenzoic acid and 3 oxy-orthotoluylic acid.—J. Pharm. Soc. Japan; through Drug. Circ., 60 (1916), 274.

Nataloïn and Homonataloïn.—*Acetyl Derivatives.*—E. Léger finds that when acetic anhydride acts on nataloïn in presence of sodium acetate three isomeric acetyl derivatives, β, γ, and δ, are obtained. If the acetate is replaced by zinc chloride the same products are obtained, the only difference being that a yellow color forms. The γ and δ acetyl derivatives, although very different, since the former is crystalline and the latter amorphous, lead to the same aloïns, identical in one case with nataloïn and the other with homonataloïn. The β-derivative is racemic and the other two do not appear to be stereoisomers, but rather different allotropic states of the acetyl derivatives.—Compt. rend.; through Chem. News, 113 (1916), 252.

Pæonyl-glucoside.—*Synthesis.*—Pæonol is not pre-existent in the root of Pæonia montana, but is formed by the action of an enzyme on a glucoside, which is split up into pæonol and dextrose. This glucoside could be obtained only in a syrupy form. Asahima and Shirabe have produced a similar glucoside synthetically, beta-pæonyl-glucoside, by the condensation of pæonol with beta acetobromglucose. The synthetic product occurs as white, microscopically small prisms which melt at 118° and have a specific rotation of —79°. The glucoside is hydrolyzed by diluted acids and, unlike the natural product, by emulsin also. It is easily soluble in water and alcohol, and when treated with acetyl chloride it forms a tetra-acetyl compound which occurs as silky needles, melts at 146° and has a specific rotation of —44.1°.—Yakagakuasshi; through Drug. Circ., 60 (1916), 211.

Pseudocubebin.—J. Halberkann obtained this substance from the bark of Ocotea usambarensis, by extraction with ether, treatment of the ethereal extract with steam and final extraction of the viscous balsam, left after steam treatment, with petroleum ether. The needles obtained by crystallization proved to be pseudocubebin, the yield being 0.5 per cent. The paper gives the properties and color reactions of the pseudocubebin thus obtained.—Arch. pharm., 254 (1916), 246; through Chem. Abstracts (1917).

Santonin.—*Pharmacology.*—Trendelenburg has proven by numerous experiments that the action of santonin is due to a strong irritation of the muscles of the worm, that the tonus is increased and violent convulsions are produced. The action is due to the lactone character of santonin because when santonin is converted into a salt of santoninic acid such a salt is physiologically inactive. —Arch. exp. Path.; through Drug. Circ., 60 (1916), 83.

Saponins.—*Classification and Significance of.*—R. Kobert groups saponins into (*a*) saponins which are precipitated by neutral lead acetate; (*b*) neutral saponins precipitated by neutral lead acetate; (*c*) saponins not precipitated by neutral lead acetate. The article gives the various saponin tests and discusses the technical and pharmaceutical importance of saponins, which he claims are harmless in foods and beverages.—Chem. Ind., 39 (1916), 120; through Chem. Abstracts (1917).

Strophanthin.— *Variability Compared to Ouabain.*—L. W. Rowe points out as a difficulty of strophanthus testing the fact that there are 20 different species of strophanthus in commerce and that there are at least three different kinds of strophanthin. Strophanthus Kombe contains both a crystalline and an amorphous strophanthin and because of the fact that the amorphous form is much less active than the crystalline, pharmacologists have inclined to the use of gratus-strophanthus or ouabain as standard for strophanthus testing.

Rowe considers this ill advised as he finds crystalline Kombe-strophanthin is more uniform in activity than is ouabain, since the latter is prone to lose its water of crystallization. He gives a method for preparing crystalline Kombe-strophanthin directly from the seed.

As to the procedure of physiologic strophanthus assays, he prefers the minimum lethal dose method of Houghton to the minimum systolic dose method given in the Pharmacopœia.—J. Am. Pharm. Assoc., 5 (1916), 1183.

Tannin.—*Detection in Plants.*—C. van Wisselingh considers a 1 per cent. solution of antipyrine or a 1 : 1,000 solution of caffeine to be the most suitable reagents for the micro-detection of tannin in the cell contents. Cupric acetate and methylene blue, sometimes used as tannin reagents, are not satisfactory. The caffeine or antipyrine reagents cause complete precipitation in the cell.

On adding water, this precipitate disappears, leaving the appearance of the cell contents normal. Therefore, they can be used repeatedly to detect the rise and fall of tannin in the same living cell. The author finds that Spirogyra maxima contains tannin; he has obtained positive indication of its presence with sixty different reagents, although some investigators have not been able to detect it in this alga. Authors differ as to the function of tannin in the life process of the plant. Wigand regarded it as taking part in cell growth. Sachs considered it to be an excretion, or decomposition product. Stahl looked upon it only as a protection against snails. The author's investigations confirm the hypothesis of Wigand.—Pharm. Weekblad; through Pharm. J., 97 (1916), 391.

Tannin.—*A Substitute for Iodine.*—Many German medical papers recommend a 5 per cent. solution of tannin in alcohol as an admirable substitute for tincture of iodine.—Chem. and Drug., 88 (1916), 38. (K. S. B.)

COLORING MATTERS.

Permissible Food Colors.—The following is the amended list of "aniline" and chemical artificial colors which alone of this class of colors are permitted to be used for tinting articles of food or drink in this country. *Yellow Shades:* (4) Naphthol Yellow S, (94) Tartrazine. *Red Shades:* (107) Amaranth, (56) Ponceau 3 R., (317) Erythrosine. *Orange Shade:* (85) Orange 1. *Green Shade:* (435) Light green S. F. yellowish. *Blue Shade:* (692) Indigo disulphonic acid.—Am. J. Pharm., 88 (1916), 185.

Anthocyanin.—*Occurrence in Flowers.*—As the result of an investigation embracing plants belonging to most widely separated members of the vegetable kingdom, such as Azolla caroliniana, Tradescantia discolor, Clivia nobilis, Fagus sylvatica, Pelargonium zonale, Cobœa scandens, and other plants, O. Gertz arrives at the following conclusions: Anthocyanin is usually found in a state of solution in the cell fluid. It frequently occurs also in the solid form, either as amorphous bodies of various shapes, or the crystalline, as rhapides, dendrites, or trichites. Separation in the solid form occurs through supersaturation of the cell fluid as a result of increased pigment formation, or by diminished water content brought about either by stimulated transpiration or by exposure to cold. Beside solid anthocyanin alone, protein and tannin particles were met with which were merely stained with the

pigment. The author has succeeded in producing anthocyanin bodies artificially by means of cell plasmolysis.—Svensk. Bot. Tidsk.; through Pharm. J., 96 (1916), 643.

Azo Colors.—*Detection in Margarine.*—A. W. Knapp states that filtered samples of margarine colored with azo dyes, solidified in small beakers and exposed to mineral acid vapors, turn pink. The beakers are put into a covered dish on the bottom of which is a filter paper saturated with hydrochloric acid. The pink color shows on the surface in two hours, and penetrates to a depth of $^1/_2$ inch in ten days.—Chem. and Drug., 88 (1916), 68. (K. S. B.)

Cochineal.—*Better Alkaloidal Indicator than Methyl Orange.*—Experiments conducted by D. B. Dott indicate that tincture of cochineal is a better indicator than methyl orange when titrating morphine and strychnine, especially when titrating direct with the acid. Mr. Lothan found an aqueous extract of the whole insect best, that from crushed insects showing oiliness. Mr. Cowie first defatted the insect with ether, then made an aqueous extract, and found it satisfactory for use with ipecac alkaloids.—Chem. and Drug., 88 (1916), 44. (K. S. B.)

ALBUMINOIDS.

Protein Assay.—*Advantages of the Wilfarth Method in Analyses of Beef Preparations.*—Vanderkleed and E'we find that this assay can be done in 1 to $1^1/_2$ hours, whereas the Kjeldahl-Gunning method takes 6 to 7 hours. The method consists in digesting the sample in a mixture of metallic mercury, phosphorus pentoxide and sulphuric acid and distillation of the colorless liquid after adding potassium sulphide, sodium hydroxide and a piece of zinc. The resulting ammonia is distilled as usual into semi-normal acid and then titrated with alkali as in the Kjeldahl method.—J. Am. Pharm. Assoc., 5 (1916), 716.

Albumin.—*Molecular Weight.*—Numerous attempts have been made to determine the molecular weight of albumin, but no very concordant or satisfactory results have so far been attained. Thus Sabanejeff and Alexandrov put the figure between 13,000 and 14,000. Herzog, from the diffusion coefficient of egg albumin, gave it as 17,000. F. Van der Feen, using solutions of albumin freed by dialysis from electrolytes, gives the very high number 26,200

as the molecular weight. These differing results are due to the apparently insuperable difficulty of freeing albumin from accompanying salts and associated impurities.—Chem. Weekblad; through Pharm. J., 97 (1916), 297.

Amino-Acids.—*Substitution for Proteins in Nutrition.*—As proteins must be completely hydrolyzed before passing into the blood, Gowland Hopkins conducted experiments to determine to what extent amino-acids might be used to replace proteins in the diet. The experiments were performed upon rats. It was found that life may be maintained and growth proceed when proteins are replaced by a mixture of amino-acids. However, when tryptophane alone, or histidine and argenine together, were removed from the diet, rapid loss of weight followed. The rate of growth was lessened when glutamic or aspartic acid was removed. Life was sustained in absence of tyrosine or phenyl alanine or both. Some closely related acids were found to replace one another. The author concludes that synthesis by the body of the simpler amino-acids necessary for building the tissues is possible, while that of others, such as the benzene ring, can be accomplished, but not quickly enough for a normal rate of growth. Some arrangements, such as that of the indol ring, seem to be beyond its power.—Chem. and Drug., 88, (1916) 582. (K. S. B.)

Caseine.—*Pyridine Bases from.*—In order to test the theory that the pyridine and quinoline rings of alkaloids might be produced by the condensation of decomposition products of proteins with other substances found in plants, especially formaldehyde, Pictet and Chou hydrolyzed caseine with hydrochloric acid, and heated it with methylal for some hours. The reaction product was distilled with quicklime, and the various products identified by their picrates, and gold and platinum salts. Pyridine, dimethylpyridine, isoquinoline, and certain derivatives of the latter were found, but there were no indications of quinoline. Caseine treated in the same way, but without the addition of methylal to furnish formaldehyde, gave almost exclusively primary and secondary bases, and none of the above-mentioned tertiary bases.—Ber.; through Pharm. Era, 49 (1916), 193.

Caseine.—*Pyridine Bases from.*—Pictet and Chou have described the formation of pyridic and isoquinoleic bases by condensation of nascent formic aldehyde with the products of acid hydrolysis of caseine. This result confirms the conclusions of

L. C. Maillard reached many years ago. He showed that amino-acids (products of the hydrolysis of albuminoids) condense very readily with the aldehyde function of sugars, and that the products of condensation (humic matters) give large quantities of pyridic bases when exposed to pyrogenation. Thus the above authors have only replaced the aldehyde alcohols of M. Maillard by simple methanal, and the individual amino-acids by the products of hydrolysis.—Compt. rend.; through Chem. News, 114 (1916), 36.

Gelatin.—*Preparation of Solution for Injection.*—Hans Trunkel uses the following method for preparing gelatin for injections:

200 Gm. best gelatin are dissolved in 800 mils water by warming in a covered 2-liter Jena beaker on a water-bath. After solution the liquid is nearly neutralized with N/1 sodium hydroxide (about 30 mils). After cooling to 45° C. four beaten whites of egg are stirred in and the covered liquid heated 90 minutes in a sterilizer. The subsequent filtration is accomplished through double filters in a steam-jacketed funnel into a 2-liter container graduated at 1000 mils. The first 100 mils filtrate are returned to the filter. After the liquid has run through the filter is washed with enough water to make 1000 mils filtrate. A stream of carbon dioxide is then passed through the solution at 37° C. for three hours (for tetanus spores), the inlet tube passing through a stopper to near the surface of the liquid, the outlet consisting of a drying tube filled with cotton. Finally 5 Gm. liquefied phenol are mixed in well, the solution quickly filled into the proper containers (ampuls) and sterilized at 60° C. After 24 hours it is again sterilized at 60° C. The resulting product contains 15–16 per cent. gelatin.

The reasons for the various steps in the procedure as well as criticisms of other methods quoted are to be found in the original article, which further gives the results of analyses of five commercial injection gelatins.—Pharm. Ztg., 61 (1916), 65. (J. H. W.)

Salicylic Gelatin.—*Preparation and Use.*—L. G. Anderson and two associates used salicylic gelatin successfully in treating a large number of septic wounds. The gelatin is prepared by fusing three hundred grammes of gelatin with 600 mils of freshly prepared normal salt solution, clearing with egg albumin, filtering and sterilizing. Two per cent. of salicylic acid is then dissolved in the fused gelatin at a temperature below 40° C. The preparation can be poured

into the wound through an irrigating funnel or directly from the bottle.—Lancet; through Chem. and Drug., 88 (1916), Supplement XXVIII. (K. S. B.)

Gelatin.—*Use as a Nutrient.*—It is generally supposed that gelatin is incapable of building tissues, and that in no way can it be regarded as a true substitute for proteins. But recent biochemical researches show that under certain conditions gelatin can replace the proteins for the purposes of nutrition. G. Totami adduces evidence that the addition of the amino-acid tryptophane alone to the hydrolysis products obtained from pure gelatin made these efficient in maintaining the nutrition of animals. The addition of tyrosine does not give the same decided effect as tryptophane. In the case of unhydrolyzed gelatin, however, it was badly digested and absorbed, and this explains the failure to obtain good results upon the addition of the missing amino-acids in previous experiments. With the addition of tryptophane to hydrolyzed gelatin in the cases of four rats experimented upon, two were not only able to maintain their weight but also exhibited some growth, and their general condition remained satisfactory. The condition of the other two rats of this set was also, for a long time, much better than that of rats receiving no tryptophane. The conclusion arrived at is that rats can maintain themselves upon the hydrolyzed products of gelatin when tryptophane alone is added.—Biochem. J.; through Pharm. J., 97 (1916), 505.

Enzymes.—*Chemical Nature of.*—Trypsin, rennin and emulsin are capable of absorbing both acids and alkalies; diastase and taka-diastase have no acid properties and pepsin is indifferent to both acids and alkalies, according to Bokorny. These amphoteric properties of some enzymes speak for their protein nature.—Allg. Brau. Hopf. Ztg.; through Drug. Circ., 60 (1916), 701.

Enzymes and Special Yeasts.—*Use in Carbohydrate Analysis.*—After pointing out sources of error in the methods at present in use for the analysis of carbohydrates, W. A. Davis explains his process, in which he makes use of enzymes and yeasts. Saccharose is estimated by fermentation of the sugar by invertase obtained from autolyzed brewer's yeast and subsequent optical examination in the saccharimeter. The fermentation method for the estimation of maltose is based upon the use of yeast free from maltase and containing only invertase and xymase. Such yeast cannot ferment maltose, but the other sugars are fermented away, leaving

only the maltose. The ordinary chemical methods of hydrolysis invariably destroy a quantity of levulose, and in a mixture of sugars it is impossible by these to estimate the maltose correctly. Starch is estimated by gelatinizing and adding taka-diastase, the mixture being left to ferment. The resulting mixture of maltose and dextrose can be estimated accurately by the fermentation process.—Chem. and Drug., 88 (1916), 41. (K. S. B.)

Diastase.—*Criticism of the Standardization of the French Codex.*—L. Grimbert publishes a critique of the so-called diastase assay of the Codex. He points out that the method of standardization is really not an assay, since there is no direct relationship between the amount of starch jelly liquefied and the amount of maltose in the liquefied portion. He finds the directions of the Codex defective as to the drying of the potash starch, the preparation of the jelly and the minutiæ of the diastatic action. In concluding he gives what he considers would be the proper wording of the Codex text.—J. pharm. chim., 13 (1916), 1.

Inulo-Coagulase.—*An Enzyme of Chicory.*—J. Wolff finds that the roots of chicory and dahlia tubers contain a substance which is an energetic coagulant of the juices extracted from these organs, and also causes the precipitation of solutions of pure inulin. Although not possessing all the characters of a diastase, this substance so far resembles these ferments that it is proposed to call it inulo-coagulase. When freshly expressed the juices of these roots quickly become turbid and soon set to a gelatinous mass, due to the action of the coagulant. If boiled, however, it loses this peculiar property, and the inulin is gradually deposited in a crystalline form. This boiled juice will often contain from 12 to 15 per cent. of inulin. If a few drops of the fresh unboiled juice are added to the boiled liquid it quickly coagulates. This proves that the coagulase is destroyed by boiling; but the fresh juice is very active on the inulin in boiled juice. Precipitation of the inulin, instead of coagulation, may be obtained as follows: The juice is diluted with an equal volume of water and divided into two portions. One is boiled; the other is quickly frozen, which causes the precipitation of the greater part of the inulin. It is then melted and filtered. On adding a single drop of this filtrate to 10 mils of the boiled juice a flocculent deposit of inulin is formed in 10 to 12 hours. The amount of precipitate is increased in direct proportion to the quantity of the refrigerated juice added up to a certain point. If the

frozen juice is boiled, or even kept at 60° C. for 15 minutes, its coagulating power is lost. Inulo-coagulase is precipitated by alcohol in a similar manner to the diastases.—Compt. rend.; through Pharm. J., 96 (1916), 445.

Pancreatic Secretion.—*Acidity of.*—Long and Fenger confirm their original statements as to the acidity of the fresh pancreatic secretion. Working on the pancreatic glands of sheep, hogs and oxen, they find the secretion from all of these decidedly acid and this acidity is fairly constant throughout the year. Secretions from the parotid gland, the liver and the spleen are less acid than the pancreatic secretion; bile is slightly alkaline or neutral; while thyroid is neutral. The acidity of the pancreatic secretion seems due to acid phosphates and to acid nucleoproteins.—J. Am. Chem. Soc., 38 (1916), 1115.

Pepsin.—*Effect on Various Salts on.*—Hamburger and Halphen find that pepsin is rendered completely inactive by the addition of salts. Although sodium chloride in a concentration of 1 : 1,000 accelerates the action of pepsin and a 1 : 400 solution has little or no effect, a 1 : 40 solution renders the peptic ferment completely inactive. Other neutral salts behave in a similar manner. Alkalies are much more strongly inhibitive. Free hydrochloric acid in the proportion of 7 : 1,000 to 9 : 1,000 also arrests peptic activity.—Arch. Intern. Med.; through Pharm. J., 97 (1916), 523.

Pepsin.—*Retarding Effect of Certain Substances on.*—In numerous experiments which have been made with pepsin in combination with various salts to determine the influence these would have upon the digestive activity of pepsin on egg albumen, C. F. Ramsey has come to the conclusion that pepsin digestion is interfered with when any of the common medicinal salts are present to the extent of three times the amount of pepsin present. Sulphates seem to have a greater retarding action than other salts. Any salt that will tend to neutralize the acid testing medium will make pepsin appear less active. Cane sugar does not appear to have any effect though saccharin has a decided influence. Tannic acid and chloroform are quite injurious even in small amounts. The writer presents tables showing the various amounts of salts added to solutions of pepsin in making his tests.—J. Am. Pharm. Assoc., 5 (1916), 30. (L. S.)

Pepsin.—*Total Nitrogen and Alpha-Amino Nitrogen Content.*—It occurred to T. B. Aldrich to ascertain something of the nature of pepsin and of enzymes in general by determining what relation, if any, exists between the total nitrogen, the alpha-amino nitrogen, and the strength of different samples of pepsin. In general, the smaller the molecule, the greater the proportion of free amino nitrogen. Aldrich's examination of the products shows that there is a progressive decrease in the percentage of the alpha-amino nitrogen in the samples in the order of their strength. According to this, it would seem as though the method used in the purification of the pepsins gradually eliminates the simpler alpha-amino nitrogen compounds, and consequently causes an accumulation of more complex bodies in the stronger pepsins. Taking it for granted, Aldrich adds, that with the still more active pepsins the recognizable alpha-amino nitrogen content will be further decreased, we should finally by sufficient purification obtain a pepsin having very little detectable alpha-amino nitrogen or an amount approximating that in the native protein. The inference is that the more highly purified or more active pepsin products approach the native proteins in complexity.—J. Am. Med. Assoc., 66 (1916), 822. (W. A. P.)

Pepsin Assay.—*Measurement of Undissolved Albumin in.*—Vanderkleed and E'we find that in the pepsin assay, according to U. S. P. VIII, the results are practically the same whether the volume of undissolved pepsin is read one-half hour or fifteen hours after the mixture is allowed to settle.—J. Am. Pharm. Assoc., 5 (1916), 718.

Eggs.—*Freshness Determined by Pepsin Test.*—In 1911, H. T. Gruber pointed out that eggs between the age of five and seven days give the best results with the coagulated albumin test for peptic activity. In the U. S. P. IX, the eggs used for assaying pepsin are now directed to be "not less than five nor more than twelve days old," in consequence of the results of these investigations. He now suggests that the age of eggs can be approximately determined by means of a pepsin test. By observing the amounts of residue obtained from the digestion of the coagulated egg-white with a pepsin of known strength, a fairly close approximation of the age of a consignment of eggs may be made. If the amount of undigested albumin exceeds that obtained with eggs from five

to twelve days old, either the eggs being tested are absolutely fresh or they exceed the latter age. In the former case, on keeping for a few days, the digestibility of the albumin will increase; whereas, if the eggs are stale, the residue on digestion becomes progressively greater. If, therefore, the second assay with pepsin shows a distinct decrease in the amount of albumin undigested, the eggs may be considered as strictly fresh.—J. Ind. Eng. Chem., 8 (1916), 911.

Rennin.—*Time Required for Coagulation of Milk by.*—Vanderkleed and E'we have regulated their rennin assays upon a fixed time for coagulation of $7^1/_2$ minutes. They have also found that if the time of coagulation falls anywhere between 5 and 19 minutes the time for coagulation of a given sample of milk is inversely proportionate to the amount of rennin employed.—J. Am. Pharm. Assoc., 5 (1916), 714.

Peroxidases.—*Detection in Milk.*—Grimmer, after pointing out objections to the use of guaiac tincture and para-phenylenediamine as reagents for peroxidases in milk, suggests the use of guaiacol and ethyl hydroperoxide. The latter is not acted on by catalase and keeps indefinitely. Guaiacol in solution of water and alcohol keeps well, especially in brown bottles placed in the dark. Several mils of milk are treated with 2 drops of a solution of guaiacol in 10 mils of alcohol diluted to 100 mils with water and 1 to 2 drops of 0.1 per cent. ethyl hydroperoxide solution. Raw milk turns intensely brick-red, while heated milk remains colorless.—Milchwirtsch. Zentr.; through Drug. Circ., 60 (1916), 758.

Urease.—*Distribution in Plants.*—M. S. Benjamin states that urease has been found in the root-nodules of seventeen species of leguminous plants examined, which are enumerated. It was not found, however, in the nodules of Medicago sativa, M. maculata, M. denticulata, or of Trifolium repens. Its presence in the root-nodules does not, therefore, seem to be universal. It was found to occur in the seeds of Cucumis melo, of Abrus precatorius and of Cucurbita moschata; in the ovules and pollen of a species of Hippocastrum; and in the dried immature leaves of a Wistaria. Three lichens—Ramillina yemensis, Xanthoria parietina, and Usnea barbata—give a very pronounced and rapid reaction with urea, and the presence of urease was also indicated in a red and in a green alga.—J. Royal Soc. N. S. W.; through Pharm. J., 97 (1916), 593.

SERA AND VACCINES.

Routine Clinic Laboratory Tests.—*Description and Significance.*—In a paper read before the Scientific Section at the San Francisco meeting, Fred I. Lackenbach describes the various laboratory methods for such clinical tests as the Wassermann and the Noguchi modification for syphilis, the complement-fixation test for gonorrhea, several blood serum tests, also the examination of spinal fluid, pus, sputum, urine, etc., and tells of their significance as diagnostic factors.—J. Am. Pharm. Assoc., 5 (1916), 17. (L. S.)

Clinical Laboratory Methods.—*Unification of.*—F. E. Niece deplores the extremely diverse findings so frequently revealed in clinical laboratory reports. He cites one case where the same sample of urine submitted to two laboratories was reported by one to contain 2.4 per cent. of glucose, while the other analyst was unable to find even so much as traces of glucose. These variations are due in some cases to the employment of different methods of detection; in many, to carelessness; and in some, to downright dishonesty. The author writes of the cut-rate business methods employed by those laboratories, which contract to do all of a physician's urinary work for a certain figure and states that the carelessness of one such concern in New York City has led the local medical societies to warn their members against the firm in question. He feels that clinical laboratory methods should be placed upon as uniform a basis as pharmacopœial testing or as food control work. He hails the inclusion in U. S. P. IX, of a chapter dealing with diagnostic reagents and clinical tests as a step in this direction and hopes that the good work thus begun can be further promoted.—J. Am. Pharm. Assoc., 5 (1916), 837.

Biologicals.—F. E. Stewart discusses the use of vaccines, antitoxins and serums for the prevention and treatment of infectious diseases. The first paper deals with the general aspects of the subject, such as explanation of micro-organisms and their behavior, the resistant action of phagocytes, immunity and its establishment by vaccines and serums. The second paper deals with vaccine virus including history, preparation and action.—Pharm. Era, 49 (1916), 429 and 465.

Serums and Antitoxins.—*Preparation.*—Charles M. Twining presents the outline of the preparation of these preparations in considerable detail and calls attention to the many difficulties which arise during the course of their preparation. As the general

method of procedure is generally understood attention will be called only to some of the important details which the author points out. Toxins from the throat of a patient suffering from diphtheria, for example, will not always produce good cultures in artificial media. Too short or too long a period of incubation produces an inferior toxin. The temperature should be 37 or 38° C., and the substance must be kept dark. Filters must be thoroughly tested, after being sterilized with steam under pressure, for their ability to remove organisms. The finished product should never contain over twenty per cent. of solids as these raise the specific gravity and thereby lessen absorption. Horses are not equally tolerant, and should be between four and eight years old. Mares are preferred because less difficult to care for. The finished standardized product decreases in unitage from 10 to 25 per cent. in one year. Evaporated to dryness it retains its strength for many years. It is, however, very difficult to get the dry powder into perfect solution rapidly, hence this is of particular value only in remote centers where supplies are obtained with difficulty.

In speaking of tetanus antitoxin the writer states that it is prepared in much the same manner as the diphtheria antitoxin except that air or oxygen must be excluded. Tetanus toxin is much more potent than diphtheria toxin, and the standard weight of the guinea pig used in testing the antitoxin is 350 Gm. instead of 250 Gm., the size and weight used in testing diphtheria antitoxin. The paper also describes antibacterial serums and hay fever serum.—J. Am. Pharm. Assoc., 5 (1916) 21. (L. S.)

Bacteria.—*Culture Media for.*—Because of the high price of agar, peptone and meat extract, F. Guth has devised a method which enables the repeated use of bacterial culture media. The previously used culture media are heated in a steam pot, during which the bacterial growth largely settles to the bottom, and the agar is then filtered through cotton. The filtrate is then cooled to about 50°, shaken with egg albumen (the white of one egg per one liter of agar), again heated one-half hour in the steam pot and strained through cotton. A perfectly clear filtrate, of acid reaction, is thus obtained; it is neutralized with N/1 soda solution and to it are added 10 Gm. milk sugar, 0.2 Gm. fuchsin dissolved in 2 mils hot alcohol, and 2 Gm. sodium sulphite dissolved in 20 mils water. The whole is then again sterilized.

As the author has further found, the meat extract of culture media may be well replaced by plant extract, the best results being

obtained with extractions of beans and soja beans. The media are prepared as follows: 100 Gm. beans are allowed to stand twice for 24 hours at room temperature with 600 mils water. The mixture is then heated for an hour in a steam pot, the supernatant liquid strained off and the residue reheated with about 500 mils water for an hour, strained and lightly pressed. The united extractions are filled up to a liter and (for the preparation of nutrient agar) 1 per cent. peptone, 0.5 per cent. salt and 3 to 4 per cent. agar added. Soja beans are treated in a similar manner except that they are heated direct in the steam pot with water without previous extraction with cold water. The further preparation of special culture media is conducted in the same manner as usual but it is advisable here to add 3.5 instead of 3.0 Gm. sodium sulphite per liter for endo-agar.

By evaporation of the aqueous bean extract to the consistence of Liebig meat extract there is obtained from 1 Kilo of beans about 200 Gm. of a dark brown extract of pleasantly aromatic odor. Soja beans yield on an average about 10 per cent. more extract which is almost odorless.—Deut. Med. Wochschr.; through Pharm. Ztg., 61 (1916), 57. (J. H. W.)

Vaccine Treatment.—Hektoen traces the stages by which vaccines, which were first employed with attempted scientific control, have come into indiscriminate and unrestrained use, with no guide beyond the statements which commercial vaccine makers are pleased to furnish with their wares. Already most physicians are realizing that the many claims made for vaccines are not borne out by facts, and that judging from practical results there is something fundamentally wrong with the method as at present so widely practiced. As clearly shown by Hektoen, "the simple fact is that we have no reliable evidence to show that vaccines, as used commonly, have the uniformly prompt and specific curative effects proclaimed by optimistic enthusiasts and especially by certain vaccine makers, who manifestly have not been safe guides to the principles of successful and rational therapeutics."—J. Am. Med. Assoc., 66 (1916), 1625. (W. A. P.)

Gaseous Disinfection.—The action of the New York City Health Department in abandoning gaseous disinfection after most communicable diseases, led S. W. Williams to send a questionnaire to health officials of all of the States and to a number of other medical authorities asking: (a) After what diseases should fumigation be

performed? (b) Is formaldehyde the best aerial disinfectant? (c) Is tuberculosis communicable in adults? (d) Should terminal disinfection be practiced after tuberculosis to protect children? (e and f) Do inanimate objects carry infection? (g) Is it safe to rely upon fresh air and sunlight as sole disinfectants? The answers given to these questions are very interesting and may be summarized as a majority favoring disinfection: preferring formaldehyde; believing formaldehyde destroys the tuberculosis bacillus; favoring the idea of infection being carried by inanimate objects. At the end of the lengthy paper, Mr. Williams discusses the best methods of formaldehyde disinfection, pointing out that while sulphur must be burned to be effective, paraformaldehyde must be vaporized and not ignited. He also states that while formaldehyde is more effective than sulphur as a bactericide, sulphur dioxide vapors are more effective as insecticides than is formaldehyde gas.—J. Am. Pharm. Assoc., 5 (1916), 185, 273 and 390.

Disinfection.—*Physical Chemistry of.*—J. F. Norton and P. H. Hsu summarize their work as follows: Acids act as disinfectants through the agency of the hydrogen ions produced by electrolytic dissociation. The disinfecting power of an acid is approximately proportional to the hydrogen ion concentration. The addition to an acid of a salt containing an anion common to this acid, diminishes its disinfecting power, as the result of a decrease in the hydrogen-ion concentration and an increase in the concentration of the undissociated acid molecules. Salts which do not appreciably affect the dissociation of an acid, greatly increase the disinfecting properties of the acid. Acid anions are positive catalyzers and undissociated acid molecules are negative catalyzers in acid disinfection.—Journal of Infectious Diseases; through Jour. Am. Med. Assoc., 66 (1916), 534. (W. A. P.)

Diagnostic Reagents.— *Use in Detection of Infectious Diseases.*— In an address given before the Scientific Section of the American Pharmaceutical Association, Dr. F. E. Stewart discussed exhaustively the theory and application of diagnostic serum tests. After explaining antigens, complements, amboceptors, bacteriolysis, hemolysis, precipitin reactions and the Bordet-Gengou phenomenon, he described Wassermann's syphilitic reaction and Noguchi's modification thereof; the complement-fixation test for gonorrhea; Widal's and also Bass' agglutination typhoid test; the tuberculin reaction as employed by Koch, by Roth-Schulz, by von Pirquet, by Lawra-

son-Brown, by Wolff-Eisner, by Moro, by Mendel and Mantoux; the luetin reaction for syphilis and the Schick test for diphtheria susceptibility. The article is one that should be read in full.—J. Am. Pharm. Assoc., 5 (1916), 975, 1196 and 1310.

Lipo-Vaccines.—Bacterial vaccines for prophylactic and therapeutic uses are commonly prepared by suspending microbes in suitable salt solutions. Lemoignic and Pinoy advocate bacterial emulsions prepared with a mixture of lanolin and petrolatum. They have established the fact that living microbes, placed in such a medium, to which 1 per cent. of camphor has been added, lose their power of reproduction at the end of a variable period, and can then be injected into healthy animals without fear of infection. In a report to the Biological Society in March, 1916, the authors stated that they had proved by careful experiment:

1. That autolysis is, if not entirely avoided, at least negligible.
2. That re-absorption takes place more slowly.
3. That reactions in sensitive individuals tend to be reduced to the minimum. Since in vaccinotherapy the auto-vaccines give most success, the authors believe that the new lipo-vaccines have superior advantages.—Sc. Am., Sept. 30, 1916, 308. (A. R.)

Bacterial Vaccines.—*Preparation by the Pharmacist.*—J. S. White strongly urges pharmacists to take up the manufacture of bacterial vaccines as a profitable and scientific side-line. In his paper he gives details of the necessary manipulation, pointing out as the six essential steps (a) preparation of the pure culture; (b) preparation of an emulsion of this culture in a saline solution consisting of 0.8 gramme of sodium chloride, 0.5 gramme of phenol and enough water to make 100 grammes; (c) counting the vaccine with a Thoma-Zeiss hemocytometer; (d) diluting the emulsion to the required strength with the saline phenol solution; (e) killing the bacteria in the emulsion by heating in a water-bath at 60° for 1 hour; (f) proving sterility of the vaccine by attempts to make cultures on nutrient agar.—Pharm. J., 97 (1916), 272.

Vaccination.—*Does It Cause Tetanus?*—At a meeting of the Philadelphia branch of the American Pharmaceutical Association, F. E. Stewart spoke of the emphasis laid by anti-vaccinationists on the death, by tetanus, of two children who had been vaccinated 26 and 27 days before the manifestation of the tetanus symptoms. Dr. Stewart pointed out that in four years (1909–1912) over 500,000 vaccinations were made in Philadelphia; that during the

same period there were 103 cases of tetanus in that city and that only 13 of the tetanus patients had been vaccinated. He denies the statement that vaccine virus of the present day contains tetanus germs and expresses the opinion that when tetanus has occurred after vaccination, the spores are introduced in the carelessly protected vaccination wound. His paper was discussed by Dr. W. S. Wadsworth and by C. O. Beasley, the latter taking the anti-vaccination side of the question.—J. Am. Pharm. Assoc., 5 (1916), 66.

Anthrax.—*Shaving Brushes as Source of.*—R. R. Elworthy describes three cases of human anthrax, one of them fatal, and these were definitely shown to have been brought about by the use of infected shaving brushes. Early diagnosis of the disease was difficult, partly on account of the type assumed by a disease which is rarely seen in the London hospitals. The identity of the bacillus, however, was proved by culture and inoculation, and it only remained to discover the manner in which infection came about. It was observed that the small local lesions came well within the individual's shaving area, and this fact suggested that a new shaving brush might have been the origin of the trouble. This clue was followed up with the result that the shaving brush was found to be the cause of the infection. It was a cheap brush made of animal hair, and bacteriological examination definitely showed that it was infected with anthrax. The infection was probably due to disease in the animals from which the hair used in the brush was obtained. Five other brushes (comprising a lot of six from the same manufacturer exposed for sale in a druggist's shop) were also examined, with similar results.—Lancet; through Pharm. J., 96 (1916), 25.

Bacillus Subtilis.—*Resistance of Certain Strains from Insects toward Chemical Agents.*—The larvæ of Tenebrio molitor, Coleopteræ, and the caterpillar of Myelois Cribrella, Lepidopteræ, harbor normally a microbe belonging to the group of Bacillus subtilis. P. Portier cultivated this microbe upon meat bouillon with and without glycerin and upon glycerin-containing yeast bouillon and tested the pure cultures for their resistivity toward a series of chemical agents. It was found that the cultures were resistant toward 5 per cent. phenol for over 50 hours; toward 20 per cent. formol solution for over 25 hours; toward 10 per cent. iodine tincture over 24 hours, but less than 48; toward Bouin's fixing fluid over 13, but less than 24 hours; toward 95 per cent. alcohol over 14 months;

toward clove oil over 4 hours; toward turpentine oil over 15 hours; toward cedar oil over 15 hours; toward chloroform over 14 months. They were not killed by boiling absolute alcohol, boiling ether or boiling chloroform.—Compt. rend.; through Apoth. Ztg., 31 (1916), 24. (J. H. W.)

Chitin and Cellulose.—*Do Bacteria Contain?*—C. Van Wisselingh has examined numerous bacteria for the presence of chitin and cellulose and found that bacteria do not contain chitin as a constituent of the cell-wall. The reports of other investigators that chitin is present in bacteria are erroneous and the results are due to inadequate methods being employed for the test. It was further found that of the bacteria examined only Bacterium xylinum contains cellulose. The methods applied were the following: A loopful of the culture was transferred to a tube containing a small amount of 50 per cent. caustic potash solution and after sealing the tube the mixture was heated gradually to 160° C. The contents of the tube were then mixed with 96 per cent. alcohol and centrifugated. The residue is washed with strong alcohol and is then tested for chitosan with iodine-potassium iodide solution and diluted sulphuric acid. For detecting the presence of cellulose the culture itself or residue obtained in the foregoing test is treated with iodine-potassium iodide solution and 66.5 or 76 per cent. sulphuric acid and with zinc chloro-iodide.—Pharm. Weekblad., 1916, 1069 and 1102. (H. E.)

Luetin Reaction.—*Effect of Potassium Iodide on.*—John A. Kolmer, Toitsu Mateunami and Stuart Broadwell, Jr., show that well-marked positive luetin reactions were observed among a group of healthy nonsyphilitic persons following the administration of potassium iodide; also similar results were observed among non-syphilitic persons suffering with various other diseases. Somewhat severe reactions were observed following the intracutaneous injection of 0.1 mil of 0.5 per cent. agar-agar, but the strongest reactions were observed when the luetin was injected during or immediately after the ingestion of potassium iodide. Positive luetin reactions were observed among normal non-syphilitic persons as late as one month after the ingestion of large doses of potassium iodide; in some instances the administration of potassium iodide caused the site of a former luetin injection to develop inflammatory phenomena progressive to pustulation. Accordingly, a positive luetin skin test has little value in the diagnosis of syphilis among persons who are taking or have recently taken potassium iodide.—J. Am. Med. Assoc., 67 (1916), 718. (W. A. P.)

Typhus Vaccine.—A paper on the discovery of a vaccine destined to diminish the virulence of the outbreaks of eruptive or exanthemic typhus was presented at the Academy of Science by Drs. Roux, Nicolle and Blaizot of the Pasteur Institute.—Chem. and Drug., 88 (1916), 68. (K. S. B.)

Vibrio Septicus.—*Toxin and Corresponding Antitoxin.*—The results of the work of A. Raphael and V. Frasey may be stated as follows: Vibrio septicus can, within 24 hours, yield a very active toxin which can in a few minutes be standardized against rabbits. The immunization of the horse takes place rapidly and without danger. The serum thus obtained protects not only against the toxin but also against infection with Vibrio septicus as well as Bacterium Chauvoei.—Compt. rend.; through Apoth. Ztg., 31 (1916), 24. (J. H. W.)

URINE, BLOOD, BILE, ETC.

Urine Specimens.—John A. Steffens describes some interesting samples and containers as well as foreign matter that often are met with in the ordinary commercial clinical laboratory. Suggestions as to collection and preservation of samples are made.—C. U. C. P. Al. J., 23 (1916), 24. (J. H.)

Fehling's Solution.—Dr. F. Klein discusses the possibility of the use of Fehling's solution as a diagnostic reagent for cancer (gycogenuria). D.-A. Apoth. Ztg., 37 (1916), 128. (J. H.)

Urine.—*A New Reaction.*—A. Bach has already shown that the reduction of nitrates and coloring matters in animal tissues is due to the simultaneous intervention of a ferment and a co-ferment which, taken separately, do not exercise any reducing action. In fresh milk this ferment exists unaccompanied by its co-ferment, and produces, either with the help of the co-ferment obtained from the tissues or with the help of aldehydes, the same phenomena of reduction as are observed in the tissues. The co-ferment can be extracted from the tissues by means of boiling water. It is found in commercial peptones and also in albumins completely degraded to amino acids. Normal urine contains appreciable quantities of the same co-ferment; that is to say, that nitrates are not reduced to nitrites by it alone, but in presence of the ferment contained in fresh milk it does reduce them. As the nitrites formed can easily be determined the reaction may be useful in physiological and pathological researches. To perform the estimation 15 mils of the fresh urine, 10 mils of fresh milk, and 1 Gm. of sodium nitrate are heated

together to 60° for twenty minutes. At the same time a blank test is prepared containing the milk and urine without the nitrate. To each solution 0.5 Gm. of finely powdered subacetate of lead is added, and the solution is shaken and filtered. The nitrite is determined colorimetrically in 20 mils of the filtrate, as in water.—Compt. rend.; through Chem. News, 113 (1916), 215.

Urine.—*Determination of Ammonia and Amino-Acids in.*—W. C. de Graaff has improved the method of Bonnema (Year Book, 1915, 403) for determining ammonia in urine and further combined it with a method for estimating amino-acids.

Ten mils of the filtered albumin-free urine are placed into a 250 mil flask, 0.5 Gm. sodium carbonate and 30 mils 96 per cent. alcohol added and 30 mils distilled off into 10 mils N/10 acid, using an Argand burner and Liebig condenser. The distillate in acid is then titrated back with N/10 alkali, using 1 mil of an aqueous 1 per cent. alizarin V. S. solution as indicator. Each mil N/10 acid corresponds to 1.4 Mgm. nitrogen. Then a mixture of 10 mils urine and 10 mils neutralized formaldehyde solution is titrated with N/10 alkali using phenolphthalein as indicator. Each mil of the alkali corresponds to 1.4 Mgm. nitrogen. The difference between the two values shows the amount of nitrogen present in the form of amino-acids.

Little is yet known concerning the significance of the occurrence of amino-acids in urine. In normal urine, only traces are to be found, chiefly glycocoll. The organism seems to use these amino acids in an extended manner by employing them like ammonia, urea and glycuronic acid to render certain substances harmless; as, for instance, hippuric acid in which the glycocoll rest occurs combined with benzoic acid which is harmful to the living organism. Probably the glycocoll occurring normally in the urine is to be looked upon as an excess to be removed.

Whereas in normal urine only traces of amino-acids are present, these increase to decided amounts in diseases, as in yellow atrophy of the liver. In the urinary sediment the amino-acids leucin and tyrosin may be found in pathological conditions separated out as difficultly soluble constituents.

In general, amino-acids occur in the urine in disturbances of metabolism, in anemia, diabetes, pneumonia, during deep narcosis, after cyanide poisoning, and during pregnancy. A special case of amino-acid elimination as a metabolic anomaly is cystinuria which

makes itself noticeable by the occurrence of six-cornered cystin plates and by the production of cystin concretions in the urinary tract.—Pharm. Weekblad; through Apoth. Ztg., 31 (1916), 28. (J. H. W.)

Urine.—*Nitric Acid Test for Albumin.*—Apothecary Wolter recommends the sodium chloride-acetic acid test as more satisfactory in view of the fact that the nitric acid test is not delicate enough.—Pharm. Zentralhalle., 57 (1916), 13. (J. H.)

Urine.—*Albumin Test in.*—Y. Sueyoshi has improved the Tsuchiya albumin test by filling a graduated test-tube half full of urine, followed by about seven-eighths of the quantity of the reagent. The amount of sediment is measured the next day. The sediment from normal urine is negligible. The reagent employed consists of 20 grammes of mercuric chloride, 5 grammes of potassium bromide, 10 mils of 30 per cent. hydrochloric acid, 55 mils of water and enough 95 per cent. alcohol to make 100 mils.—Mitteil. med. Fakultät Univ. Tokyo; through J. Am. Med. Assoc., 66 (1916), 930.

Urine.—*Detection of Egg-Albumin in.*—P. Godfrin states that malingerers sometimes resort to intravesical injections of egg-albumin, thus producing a urine similating nephritis. He finds that the albumin thus introduced in the urine can be distinguished from pathologic albumin by Maurel's reagent; by "formol-acetic" mixture and by the use of precipitins. However Godfrin prefers the simpler procedure of adding to the urine 1 drop of glacial acetic acid followed by an excess of pure sodium chloride. This precipitates all of the pathological albumin within a few minutes, whereas the egg-albumin remains in solution. Then the microscopical examination of the sediment will always show the deception.—J. pharm. chim., 14 (1916), 257.

Urine.—*Assay of Albumin in.*—R. Dhommée discusses the various suggested methods of albumin assay—gravimetric, Denigès' volumetric and Esbach's. He finds the latter most satisfactory but unreliable. He has therefore modified it and recommends that the test be carried out in a graduated centrifuge tube, into which are poured, prior to twirling, 10 mils of the urine and 5 mils of a trichloracetocitropicric reagent made by dissolving in 1000 mils of water, 5 grammes of picric acid, 10 grammes of trichloracetic acid and 25 grammes of citric acid. From the volume of precipitate obtained, the amount of albumin may be deduced.—J. pharm. chim., 13 (1916), 241.

Urine.—*A Peculiar Case of Albuminuria.*—P. Godfrin reports a case of albuminuria occurring in a soldier 38 years old. The albumin was not precipitated by either sodium sulphate or sodium chloride until it was acidulated with a few drops of acetic acid. The minutiæ followed by him in the study of this urine is discussed in two papers.—J. pharm. chim., 13 (1916), 249 and 14 (1916), 294.

Urine.—*Detection of Caffeine as Indication of Malingering.*—Hollande and Thevenon state that some "slackers" in France attempt to evade military duty by taking from 0.5 to 1 gramme of caffeine (or the equivalent amount of coffee) thus simulating tachycardia, the pulse beats increasing to as much as 160 per minute. This trick can be detected by hunting for caffeine in the urine, by clarifying it with solution of lead subacetate and extracting the filtrate with chloroform. If caffeine is present, the chloroformic extract on evaporation yields radiating crystals of caffeine, which can be tested by Weidel's reaction, by the murexide test, or by use of solution of ammonium sulpho-molybdate or potassium iodobismuthate.—J. pharm. chim., 14 (1916), 324.

Urine.—*Creatin in.*—One important observation made by F. H. McCrudden and C. S. Sargent is that human urine contains a substance or substances other than creatin which can give a color reaction similar to that of creatinin on boiling with picric acid, and which, therefore, may appear in the results as creatin.—Journal of Biological Chemistry; through Jour. Am. Med. Assoc., 66 (1916), 1430. (W. A. P.)

Urine.—*Color after Administration of Cryogenin.*—Gallois and Mouchel state that after the administration of the popular French synthetic cryogenin (meta-benzamine-semicarbazide) the urine is colored an intense brown suggestive of jaundice. The difference between such urine and that containing bile is simple to note, however, since cryogenin urine, after acidulation, assumes the amber tint of normal urine. The authors have endeavored to trace the cause of the intense color of cryogenin urine. They find that mere solution of that synthetic in voided urine does not give the intensely brown solution. Oxidizing agents or sufficient exposure to air produce to some extent the color, seeming to point to the fact that the color is due to some oxidized compound of cryogenin with some urine constituent. A urine voided after administration of cryogenin is colored a deep red on treatment with potassium persulphate and hydrochloric acid; solutions of cryogenin in voided urine do not give the color except when concentrated.

Gallois and Mouchel then studied the various urinary tests to discover whether the presence of cryogenin would produce fallacious results. They find the only tests seriously affected by its presence are the copper reduction tests and if the synthetic is removed by clarification of the urine with mercury salts, even these tests may be applied.—J. pharm. chim., 13 (1916), 372.

Urine.—*Dextrose Assay by the Fermentation Method.*—Dried yeast is recommended by A. Bolland and A. Krausz. Since such yeast is stable up to six months it is sufficient when obtaining it to see that it possesses fermenting power and shows no appreciable self-fermentation. The daily controls and the necessity of frequently obtaining yeast are thus eliminated.—Chem.-Ztg.; through Pharm. Ztg., 60 (1916), 49. (J. H. W.)

Urine.—*Drugs Affect Reaction of.*—The following drugs make the reactions in the examination of urine unreliable for diagnosis: By analgesin the color of the urine is changed to blood-red, becoming yellow, as it is rendered alkaline; by pyramidon it is changed to salmon to cherry-red; by sulphonal, to red-brown; by naphthalin to black or grayish brown; by salol, to dark green or black after long usage; by phenol, to reddish brown; by bromoform, to dark green; by naphthol, to olive-green or orange when strong doses are administered; by santonin, to yellow, turning to red on the addition of an alkali; by cascara, senna, or rhubarb, to yellow or light red-brown, turning red on the addition of an alkali. The estimation of glucose by means of the polariscope or by Fehling's test is rendered unreliable by acetanilide, salicylic acid, copaiba, hydrated chloral, salol, or sulphonal, which when administered in large doses render the urine levogyrate.—Gacet. Farm. Espan.; through Drug. Circ., 60 (1916), 607.

Urine.—*Elimination of Glucuronic Acid from.*—Some samples of pathological urine contain glucuronic acid which reduces both Fehling's and Nylander's reagents and therefore interferes in glucose tests. Franzos removes this acid by treatment with 20 per cent. lead subacetate solution, the filtrate from which can then be tested for glucose.—Zeit. oesterr. Apoth.-Ver.; through Drug. Circ., 60 (1916), 145.

Urine.—*Presence of Lead in Trench Nephritis.*—C. P. White has been led to believe that the incidence of trench nephritis pointed to the possibility of its being attributable to the large use of tinned

food in the diet. There is no reliable rapid method of detecting it in urine. For the purpose of the investigation, reliance was placed on the direct chemical examination of the ash after evaporating the urine to dryness and igniting the residue. Other methods were used to serve as controls. Of four cases examined, lead was present in all. The constant presence of lead in these cases and the presence of tin as well in one of them naturally suggest the possibility of the metals being derived from tinned foods. If a solution of sodium chloride be boiled for 10 minutes in a stamped tobacco tin (which has no joints) it does not extract any metals. If, however, a small piece of solder is placed in the tin containing the solution, boiling for ten minutes causes some lead and tin both to go into solution. Again, if a salt solution is boiled in an ordinary fruit or meat tin, it extracts traces of lead and tin, and if the solution contains the slightest trace of acid the amount of metals dissolved is markedly increased. It is impossible, says the author, to draw any conclusions from four cases only. The presence of lead in the urine may have no significance in the etiology of the disease *qua* "nephritis," but may be of significance *qua* "trench."—Lancet; through Pharm. J., 96 (1916), 555.

Urine.—*Levulose and Albumin in.*—Gaillard reports a case where a wounded soldier voided a urine containing 20.5 grammes of total albumin per liter and 1.9 grammes of levulose per liter. Contrary to the opinions of others (see page 416) he finds that Maurel's reagent (33 per cent. sodium hydroxide solution, 25 mils; 3 per cent. copper sulphate solution, 5 mils; glacial acetic acid, 70 mils) precipitates pathological albumin, as well as ordinary egg-albumin. —J. pharm. chim., 14 (1916), 321.

Urine.—*Levulose and Albumin in Same Sample.*—Mallat and Gérand report on a sample of urine examined by them which contained 5.10 grammes of levulose and 56.7 grammes of albumin to the liter. It had the density 1.027 at 15° and was of acid reaction.

They precipitated the albumin by use of heat and determined the levulose in the filtrate and washings with Fehling's solution and by use of the polariscope.—J. pharm. chim. (7), 14 (1916), 103.

Urine.—*Detection of Picric Acid in.*—In a lecture before the Paris School of Pharmacy, L. Grimbert gave a detailed description of the present importance of the detection of picric acid in urine and explaining the various tests suggested since the war began.

He points out that urine may contain either picric acid or its reduction products, picramic acid, $C_6H_2NH_2(NO_2)_2OH$; diaminomononitrophenol, $C_6H_2(NH_2)_2NO_2.OH$; or triaminophenol, $C_6H_2(NH_2)_3OH$. He describes fully the properties of these substances and pays particular attention to tests for their identity. He finds Le Mithouard's reagent (ferrous sulphate, 2; tartaric acid, 10; distilled water, 100) most satisfactory, the red ring produced showing in a dilution of 1 in 500,000. Many bibliographical references are given in the paper.—J. pharm. chim., 13 (1916), 177.

Urine.—*Detection of Picric Acid in.*—Barthe and Frédoux publish their experiences in the examination of urine of malingerers who have taken picric acid. Their report confirms Grimbert's views on the subject. Their paper also discusses the detection of picric acid in the blood and feces.—J. pharm. chim., 13 (1916), 369.

Urine.—*Detection of Picric Acid in.*—Murat and Durand find that the toxicity of picric acid is low. Doses of 1 Gm. and more are well tolerated; after the former dose only a feeling of fatigue is apparent; the temperature remains normal, and there is no functional disturbance. The color of the urine produced by picric acid is always of a more or less deep mahogany tint; but the same shade is often met with in true jaundice. The elimination commences about six hours after taking the dose. Its persistence varies with the amount taken: after 0.20 Gm., for about 4 days; after 0.50 Gm. for 6 days; and after 1 Gm. 12 days. The formation of a pink ring when the urine is treated with ferrous sulphate and a solution of tartaric acid was found to be the most sensitive of all the tests employed. These were (a) staining of wool by the ether extract of the urine acidified with hydrochloric acid; (b) the formation of a pink liquid on warming this dyed wool in potassium cyanide solution; (c) formation of potassium isopurpurate; (d) precipitation with ammoniacal cupric sulphate; (e) precipitation with methylene blue; (f) reaction with β-naphthol and sodium nitrite, with formation of an ether-soluble pink color; (g) precipitation with basic lead acetate; (h) precipitation with barium chloride. No single case of genuine jaundice of the 160 under treatment gave a positive reaction with any one of the above tests.—J. pharm. chim.; through Pharm. J., 96 (1916), 133.

Urine.—*Abnormal Pigment in.*—E. Justin-Mueller in 1915 described a yellow pigment found in the urine of jaundice patients. As many of its characteristics were suggestive of the pigment pro-

duced after the administration of cryogenin (see page 417) the author reviewed his work, applying tests to the urine of a patient voided before and after the administration of cryogenin. He finds a distinct difference in the pigment before and after taking cryogenin and therefore concludes that the pigment described by him is distinct from that produced by the ingestion of cryogenin.—J. pharm. chim., 14 (1916), 199.

Urine.—*The Phenolsulphonephthalein Test of Renal Functionation.*—It is now almost universally conceded by broad-minded medical men that, for ascertaining the eliminating power of the two kidneys or the special ability of either kidney, the ideal test is closely approached by phenolsulphonephthalein, says H. A. B. Dunning in a paper presented to the Scientific Section at the San Francisco meeting. The most remarkable property of this chemical substance (whose manufacture is also described) is the manner in which normal kidneys dispose of it, fully 85 per cent. of an injected quantity being thrown off through renal functionation within two or three hours. Investigations seem to have shown that it is even less toxic than sodium chloride. The essential features of the test are as follows:

One mil of the solution, containing 6 milligrammes of "phthalein" as a mono-sodium salt, is injected into the arm or the buttocks; after about ten minutes the "phthalein" may be detected by catheterizing and passing the urine into a test-tube containing solution of sodium hydroxide; thereafter for an hour the entire amount of urine excreted is collected. The present procedure is to collect excreted urine for an hour and ten minutes from time of giving injection. Sufficient sodium hydroxide solution is added to make alkaline, and the whole is diluted to 1000 mils. The quantity of "phthalein" eliminated is determined colorimetrically, by comparing the specimen collected with a standard solution of "phthalein" prepared by dilution of 1 mil of "phthalein" solution containing 6 milligrammes to 1000 mils with water made alkaline. This comparison is most accurately made through the use of a colorimeter.

The value of the test depends upon the following facts: 40 to 60 per cent. of the "phthalein" injected is eliminated by normal kidneys within one hour, irrespective of the amount of urine excreted. If the amount of the substance eliminated is very low, 5 per cent. to 30 per cent., then the kidneys are not functionating properly.

This diagnostic test has attracted wide-spread attention not only in this country but also in England, France, Germany, Japan and Australia.—J. Am. Pharm. Assoc., 5 (1916), 268. (L. S.)

Urine.—*Detection of Salvarsan in.*—A new dose of salvarsan should not be administered until the previous dose has been completely eliminated from the system. This may be done by examining the urine according to Abelin. Five to seven mils of the urine are mixed with 4 drops of diluted hydrochloric acid and 3 drops of a 0.5 per cent. sodium nitrite solution and this mixture is carefully poured on a freshly prepared solution of 0.3 Gm. resorcin, 3 Gm. of water and 3 Gm. of 20 per cent. caustic soda solution. In the presence of salvarsan a red ring is formed at the zone of contact of the two liquids and on mixing the two layers a red color is imparted to the liquid. The formation of the dyestuff is due to the presence of two amino groups in the salvarsan. Freijmuth recommends that this test should be supplemented by Marsh's test (Berzelius' modification) and that the organic matter should be destroyed by means of antiformin.—Apoth. Zeit.; through Pharm. Weekblad, 53 (1916), 1517. (H. E.)

Urine.—*Colloidal Sodium Urate in.*—It has long been an accepted fact that sodium urate exists in urine in the colloidal form under certain conditions. Shade and Boden have shown the possibility of this some time ago. More recently Prof. Bechgold succeeded in proving conclusively that sodium urate, in the colloidal form, is present in urine. He likewise succeeded in isolating this substance, and with the aid of ultrafilters succeeded in making a quantitative determination. The average of a number of determinations shows that 25 per cent. of all urates are present in the colloidal form. Bechgold points out the importance of this from a biological view point. The uric acid of the body, so long as it is not in excess, is partly destroyed by the urinary ferments, while the rest is eliminated by the kidneys. When the uric acid is in excess, and remains in the crystalline form, it is readily soluble, and its elimination may be brought about by various means. This is said not to be the case when the acid appears in the colloidal form.—C. U. C. P. Al. J., 23 (1916), 167. (G. C. D.)

Urine.—*Tyrosin Crystals in Sediments.*—P. Inge comments on the frequency with which investigators report the presence of tyrosin crystals in urinary sediments. The author during his connection with the Vichy baths from 1882 until 1913 had occasion to examine

upwards of 31,000 samples of urine, and states that only in one instance did he find crystals of this substance in the samples examined. There were numerous instances where deposits simulated in appearance tyrosin. Further examination, however, proved the fallacy of this diagnosis. In the one undoubted case the urine of the patient, upon arrival of the baths, was brown-yellow in color, and contained traces of both albumin and sugar. Microscopically, crystals of uric acid and calcium oxalate were shown to be present, as were likewise epithelial cells, leucocytes, and hyaline and granular casts. After 10 days of treatment, all normal constituents of the urine were eliminated in increased quantity, excepting urea. Of the latter 1.81 grammes per liter was found. The sediment was abundant and heavy, and contained a considerable quantity of tyrosin crystals, besides numerous crystals of calcium oxalate. Epithelial cells were scant, and the casts had disappeared. The tyrosin crystals occurred in the form of long, yellow-white, silky needles, some of which were grouped in bundles, while others were single. The crystals dissolved readily in alkalies and in mineral acids, and responded to the reaction of Piria.—J. pharm. chim.; through C. U. C. P. Al. J., 23 (1916), 87. (G. C. D.)

Urea.—*Specifications for Pure.*—P. Borisch gives the following tests for urea for medicinal use: If 1 gramme is dissolved in 1 mil of water, it will require about 1.5 mils of concentrated nitric acid to produce a complete separation of urea nitrate. In the same way, when the nitric acid reaction for urea is employed, no more than 1.5 mils of the concentrated acid should be necessary to show the test on 1 gramme of urea.—Pharm. Zentralhalle, 57 (1916), 255.

Urea.—*Assay with Urease.*—H. A. B. Dunning describes the use of urease, the enzyme of soy bean as a reagent from converting urea into ammonium carbonate. He has succeeded in preparing urease as an almost white powder, that is practically free from water-soluble proteins. By its use is made possible a simple and expeditious assay of urea that is markedly superior both in case of manipulation and in accuracy to the hypobromite assay of urea.

The manipulation consists in determining with decinormal hydrochloric acid and methyl orange the natural alkalinity of the urine sample and comparing this with the alkalinity of the same volume of the same sample that has been treated with urease. The difference represents the ammonium carbonate that has been produced from the urea, the factors being each mil of decinormal

hydrochloric acid equals 0.0048 Gm. ammonium carbonate or 0.0030 Gm. urea. The paper gives details of manipulation.—J. Am. Pharm. Assoc., 5 (1916), 809.

Urea.—*Assay with Urease.*—White and Williams call attention to a method for the estimation of urea in urine by means of the enzyme urease. It is claimed to be more accurate than the "hypobromite" method in which a variable amount, usually about 95 per cent., of the nitrogen is liberated. Benedict's method is accurate but requires much attention. Like Benedict's, this method requires a separate estimation of ammonia existing as salts. If urease itself is obtainable it may be added directly to the urine and complete hydrolysis takes place in about fifteen minutes. Since it is not always available, powdered soya bean, which is rich in urease, may be utilized. To 25 mils of urine 4 or 5 Gm. of the powdered bean are added and the mixture allowed to stand overnight, the surface being covered with a thin film of benzol or xylol. Then a non-volatile alkali is added, the ammonia distilled and the estimation made as in Benedict's method. The reaction is one of hydrolysis.

$$\begin{matrix} HN_2 \\ \\ NH_2 \end{matrix}\!\!\rangle CO + H_2O = (NH_4)_2CO_3.$$

—Pharm. J., 96 (1916), 323. (Z. M. C.)

Uric Acid.—*Assay in Urine.*—Kashirabara determines uric acid by taking 100 mils of urine, making faintly alkaline with sodium carbonate, then adding 10 per cent. zinc sulphate solution. The resulting precipitate is collected, washed free from sulphates, transferred to a flask, mixed with water and acetic acid, after which the uric acid compound is decomposed by passing hydrogen sulphide through the mixture. The mixture is then boiled and from the filtrate the uric acid is separated by concentration, crystallization after addition of hydrochloric acid, and weighed after drying.—Z. physiol. Chem.; through Drug. Circ., 60 (1916), 145.

Uric Acid.—*Supposed Solvents.*—H. D. Haskins has studied the uric acid solvent power of urine of persons taking the various substances classed as uric acid solvents. The investigation led to the following conclusions: 1. Piperazin can cause the urine to dissolve more uric acid than it would without the drug, and this effect is most marked if sodium citrate or bicarbonate be also given

and if diuresis be avoided. 2. Lysidin can act as a uric acid solvent but is not a practical therapeutic agent because of the large doses required. 3. Lithium carbonate is a uric acid solvent if large enough doses are used, but is unsafe and possesses no advantage over sodium citrate or bicarbonate. 4. Sodium citrate and bicarbonate are reliable and satisfactory uric acid dissolving agents when given in such dosage as to keep the urine alkaline.—Arch. Int. Med., 1916, 405. (W. A. P.)

Urogon.—According to Mooser, this is an aromatic body of uncertain composition, which gives urine distillates their characteristic stable odor. Fricke has found it in the urine of all domestic animals and of man, being more abundant in the urine of herbivora than of carnivora.—Deutsch. Med. Wochschr.; through Pharm. Zentralhalle, 57 (1916), 112.

Bile.—*New Researches on.*—Commenting on the recent researches of S. Okada, undertaken in the Institute of Physiology in University College, London, and on the work of other investigators in the same field, it is stated that precisely as certain foods are known to have specific effect on the gastric secretion, so can other substances be employed therapeutically for the effect they produce on the biliary secretion. White of egg, fats, oils, acids, "peptones," and meat extracts, when administered, all produce an increased secretion of bile, which is more dilute than normal. When bile itself or its salts are given, stimulation of the flow of bile also occurs, but the secretion then contains a higher percentage of solids than normal, although its color is lighter. Sugar, cakes of starch and sugar, water, and sodium bicarbonate have no apparent effect. While there is no question as to the potency of bile itself when administered as a cholagogue, other reputed therapeutic agents are not accepted. Calomel, that much vaunted drug for "biliousness," whatever that may mean, is found by Okada to be without any effect on the biliary secretion. In this respect, he confirms earlier evidence of the same sort. Sodium salicylate and chloral hydrate are reported to provoke biliary flow strongly. Phenyl salicylate, cream of tartar, and alcohol in large doses are likewise found to be distinct biliary stimulants. Atropine causes a slight diminution in the secretion of bile.—J. Physiol.; through Pharm. J., 67 (1916), 55.

Blood.—*Use in Bread.*—Bread can be made more nutritious and appetizing by the addition of albuminous substances, such as milk and eggs to the dough, which however, at the present time are very

expensive. In blood, a necessary by-product at the abattoirs, we have a highly nitrogenous and nutritious substance, at a very nominal cost. Besides that, blood is rich in those mineral salts which are necessary for the body. R. Droste recommends hydrogen peroxide to bleach, sterilize and deodorize blood. Besides, the large quantity of liberated oxygen forms a highly effective means of aerating or "raising" the bread, thus making the use of yeast or baking powder unnecessary. Blood is the raw material which is converted into milk or eggs, but the public has a prejudice against it.—Chem. Ztg.; through Sc. Am., Feb. 12, 1916, 172. (O. R.)

Pus.—*Detection of Oil of Turpentine and Gasoline as Indication of Malingering.*—It has been found that some "slackers" try to escape service by producing abscesses by injecting under the skin one or two mils of either oil of turpentine or gasoline. This destroys the surrounding tissue, with the formation of a considerable amount of pus. A. C. Hollande describes the methods employed in detecting this trick. Microscopical examination of the pus usually shows aseptic condition and the oil of turpentine or gasoline can be identified (and distinguished from oils that may have been used in dressing the wound) by their color reactions with alcoholic solution of Nile blue and by their solubility in acetaldehyde. The paper also gives chemical tests for detection.—J. pharm. chim., 13 (1916), 337.

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(List corrected to Jan. 28, 1918.)

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56 Ave B, New York, N. Y.
Tobin, John J.,
243 Dorchester st., S., Boston, Mass.
Tocco, Orazio,
211 W. 10th st., New York, N. Y.
Todd, Albert May,
323 N. Rose st., Kalamazoo, Mich.
Todd, Joseph A.,
501 4th st., Sioux City, Ia.
Toller, Adolph J.,
417 W. Third st., Sioux City, Ia.
Tompkins, George R.,
Hudson & Vestry sts., New York, N. Y.
Toomer, S. L.,
Auburn, Ala.
Topp, Henry,
1313 Washington st., Portsmouth, Va.
Topping, Arthur E., Ph.G.,
Overbrook, Kans.
Topping, Geo. B., Ph.C.,
61 Parsons ave., Columbus, O.
Trantham, Isham A.,
876 N. Main st., Springfield, Mo.
Tremble, John Edward,
644 St. Catherine st., West, Montreal, Quebec, Canada.
Trienens, Joseph,
819 Buena ave., Chicago, Ill.
Trimbach, Alfred Richard,
158 Horton st., Lewiston, Me.
Troupin, Eli Salmon,
124 Pacific st., Stamford, Conn.
Troxell, Charles Horner,
130 W. Fourth st., Weston, W. Va.
Troxler, Robert Fulton,
U. S. Marine Hospital, San Francisco, Cal.
Truby, Miriam Grace (Miss),
502 Kely st., Wilkinsburg, Pa.
Truedson, Eric P.,
122–124 S. Meridian st., Puyallup, Wash.
Tucker, Thomas H.,
28–30 Fulton st., New York, N. Y.
Tupper, Edward A.,
Chicago & Tenth sts., Minneapolis, Minn.
Turner, Joseph L.,
c. Briston-Myers Co., 281 Greene ave., Brooklyn, N. Y.
Turner, Leland S. P.,
2443 Cherry st., Toledo, Ohio.
Turner, Thomas David,
Henning, Tenn.
Tuthill, Fred P., Ph.G., Phar.D.,
1457 Union st., Brooklyn, N. Y.
Tuttle, Geo. O.,
387 Congress st., Portland, Me.
Tyler, Earl Albert,
5 Bryant Terrace, Rahway, N. J.
UHLICH, FERDINAND G.,
2001 Salisburg st., St. Louis, Mo.

Ulm, Hamilton C.,
224 Jackson st., Toledo, O.
Umenhofer, Adolph,
2405 N. Halsted st., Chicago, Ill.
Upjohn, Lawrence N., M.D.,
48 Vesey st., New York, N. Y.
Uran, David R.,
42 W. 119th st., New York, N. Y.
Urbish, A. J.,
Oak Lawn & Dickson, Dallas, Tex.
Urdong, Bertha,
52 St. Nicholas ave., New York, N. Y.
Urban, Leopold C.,
531 Market st., Milwaukee, Wis.
Utech, P. Henry, Ph.G.,
209 Chestnut st., Meadville, Pa.
Utley, Albert T.,
145 Main st., Norwich, Conn.
Utterback, Earl,
532 S. Van Buren st., Iowa City, Ia.
Vaccarino, Joseph Anthony,
295 Elizabeth st., New York, N. Y.
Vahlteich, Hans Walter,
2000 N. Halsted st., Chicago, Ill.
Valentine, Chas. Philip,
Department of Pharmacy, University of Montana, Missoula, Mont.
Valin, Ivan Joseph,
9 Orchard st., Auburn, N. Y.
Valvano, John Arthur,
2059 1st ave., New York, N. Y.
Van Aller, Thos. S.,
210 S. Broad st., Mobile, Ala.
Van Antwerp, James C.,
250 State st., Mobile, Ala.
Van Derveer, Robert H.,
Broad & Monmouth sts., Red Bank, N. J.
Van Dyke, Chas.,
253 6th st., Salt Lake City, Utah.
Van Liew, Wm. K.,
Akron, Colo.
Van Schaack, Cornelius P.,
116 W. Lake st., Chicago, Ill.
Van Vleet, M.,
506 Gratiot ave., Detroit, Mich.
Vance, Winfield S.,
5th & Broad sts., Gadsden, Ala.
Vanderkleed, Chas. E.,
200 Harvard ave., Collingswood, N. J.
Vane, Patrick P.,
309 B st., S. E., Washington, D. C.
Vargas, Heredis Jorge,
1120 Boylston st., Boston, Mass.
Varney, Edw. F.,
1580 Madison st., Oakland, Cal.
Varnum, Walter H.,
801 Massachusetts st., Lawrence, Kans.
Vaupell, Geo. F., Ph.C.,
758 S. Western ave., Chicago, Ill.
Vazquez, Carlos R., M.D.,
13 Calixto Garcia, P. O. Box 49, Manzanillo, Cuba.
Veillin, Louis, M.D.,
1800 S. Second st., Monsanto Chemical Works, St. Louis, Mo.
Vellema, Peter,
5 Leonard st., N. W., Grand Rapids, Mich.
Velsor, Joseph H.,
9 Gold st., New York, N. Y.
Verneau, Edward J.,
147 Irving st., Rahway, N. J.
Vernor, James,
33 Woodward ave., Detroit, Mich.
Vestal, John Wilfred,
402 E. Raymond st., Indianapolis, Ind.
Vidal, Carlos, Phar.D.,
P. O. Box 416, Cruces, Cuba.
Viehover, Arno, M.D.,
Department of Chemistry, Urbana, Ill.
Vilas, Fred L.,
Pierre, S. D.
Vitous, Walter J., Ph.C.,
c. Morton Drug Co., Morton, Wash.
Vitz-Simon, Vincent Joseph,
829 N. Main st., Brockton, Mass.
Vodheim, Joseph,
Tyler, Minn.
Voigt, Joseph F.,
840 Market st., Chattanooga, Tenn.

Voiss, Arcadius,
4700 Kenwood ave., Chicago, Ill.
Vold, John H.,
26 S. 3rd st., Grand Forks, N. D.
Von Hermann, Eugene,
122 S. Michigan ave., Chicago, Ill.
Vordick, August H.,
2329 A. Hebert st., St. Louis, Mo.
Vorsanger, Lillian,
2354 Milwaukee ave., Chicago, Ill.
Voss, Edw., Jr.,
1201 Vine st., Cincinnati, O.
Votteler, Wm.,
Shelby & Oak sts., Louisville, Ky.
Vowell, Louis S.,
62 S. Main st., Washington, Pa.
Wagner, Arthur C.,
11 Pierce ave., Everett, Mass.
Wagner, Leonard R.,
203 N. Ingalls ave., Ann Arbor, Mich.
Wagner, Louis,
Mountain View, Cal.
Wakeman, Nellie A.,
356 Chemistry Bldg., Madison, Wis.
Walbrach, Arthur,
1200 15th st., Denver, Colo.
Walbridge, Cyrus P.,
N. E. cor. 4th & Market sts., St. Louis, Mo.
Walker, Alfred,
Sutton, W. Va.
Walker, Charles Robert,
Ensley, Ala.
Walker, Joseph P.,
Charity Hosp., New Orleans, La.
Walker, Robert H., B.S., Ph.M.,
Gonzales, Tex.
Wall, C. LeRoy,
5829 Montrose st., Philadelphia, Pa.
Wall, John R.,
62 W. 36th st., New York, N. Y.
Wall, Henry Frank,
Residence Unknown.
Wall, Otto A.,
4108 W. Pine st., St. Louis, Mo.
Wallace, George R.,
426 Fairmount ave., Philadelphia, Pa.
Wallace, John C., Phar.D.,
113 E. Washington st., New Castle, Pa.
Walleck, Andrew E.,
8341 Woodland ave., Cleveland, O.
Walpole, Robert E.,
Springfield, S. D.
Walsdorf, Edw. H.,
900 Peters ave., New Orleans, La.
Walter, Adeline,
Sheridan, Mont.
Walter, Herman,
213 Second ave., New York, N. Y.
Walter, Peter G., Ph.G., Phar.D.,
Chestnut & Lockhart sts., Pittsburgh, Pa.
Waltermann, Henry B.,
5th & Lock sts., Cincinnati, O.
Walton, Lucius L., Ph.G., Ph.M., Ph.D.,
N. E. cor. 4th & Pine sts., Williamsport, Pa.
Walz, Jacob L.,
2128 Mt. Holly st., Walbrook, Baltimore, Md.
Ward, Francis W.,
15 S. Main st., Memphis, Tenn.
Wardle, Arthur S.,
1–3 Warren st., Hudson, N. Y.
Warn, Wm. E.,
50 First st., Keyport, N. J.
Warner, Cortice M.,
4357 N. Penn st., Indianapolis, Ind.
Warner, William James,
2228 B McKinley ave., Berkeley, Cal.
Warren, Lewis E.,
3833 Flad ave., St. Louis, Mo.
Washburn, Crosby B.,
32 Adams ave., W., Detroit, Mich.
Washburn, Homer C., Ph.C., B.S.,
Residence Unknown.
Wasserscheid, August A.,
30 & 32 Platt st., New York, N. Y.
Waters, Morris Wilson,
1344 Wisconsin ave., N. W., Washington, D. C.
Watkins, Chas. Wm.,
227 S. Illinois st., Indianapolis, Ind.

Watson, Elmer A.,
Clayton, Ill.

Watson, George N.,
1009 Maine st., Lawrence, Kans.

WATSON, HERBERT K.,
803 Market st., Wilmington, Del.

Watson, Joseph R., Ph.C.,
330 18th ave., N., Seattle, Wash.

Watson, Robert Gordon,
1103 Cook st., Denver, Colo.

Watson, Wm., Jr.,
1117 Howard ave., Utica, N. Y.

Watters, Alex. J.,
Cor. Fifth & Wall sts., Los Angeles, Cal.

Watters, Henry,
138 Rideau st., Ottawa, Can.

Watts, Thomas McCoy,
Holstein, Ia.

WAUGH, GEO. J.,
Ontario st., Stratford, Ontario, Can.

Wear, John,
3648 Chestnut st., Philadelphia, Pa.

Weaver, Clarence A.,
941 Trumbull ave., Detroit, Mich.

Weaver, Robie Rolland, Ph.G.,
1615 S. Penn. st., Muncie, Ind.

Webb, Edw. N.,
2120 Iuka ave., Columbus, O.

Webb, John W.,
Main st., Stuttgart, Ark.

Webber, Daisy B. (Mrs.),
2450 Wylie ave., Pittsburgh, Pa.

Weber, Don C.,
Arlington, Neb.

Webster, Duane Earle,
North st., Grafton, Mass.

Webster, John H., Ph.G.,
866 Jefferson st., Detroit, Mich.

Webster, Richard C.,
26 N. Main st., Canton, Ill.

Weeks, Carl,
Des Moines, Ia.

Weeks, John A.,
706 Hutchins ave., Ballinger, Tex.

Weicker, Theo.,
Prospect Manor, Stamford, Conn.

WEIDEMANN, CHAS. A., PH.G., M.D.,
2148 Green st., Philadelphia, Pa.

Weik, John,
Edward & Madison Rd., Cincinnati, O.

Weil, Jacob,
269 Canal st., New York, N. Y.

Weinar, William,
122 S. First st., Mt. Vernon, N. Y.

Weinkauff, Jacob,
600 Fifth ave., Peoria, Ill.

Weise, Carl E.,
2704 West End ave., Nashville, Tenn.

Weiser, Wm. P.,
501 Market st., Camden, N. J.

Weisner, Nicholas F.,
20th & Parrish sts., Philadelphia, Pa.

Weiss, Conrad H.,
1907 Nicholas ave., Anacostia, D. C.

Weiss, E. E.,
Higgins, Tex.

Weiss, Emil O.,
794 6th ave., New York, N. Y.

Weissmann, Charles,
2332 Highland ave., Cincinnati, O.

Welch, Sister Mary Bernard,
Hotel Dieu, 2004 Tulane ave., New Orleans, La.

Welfare, Sam E.,
Winston-Salem, N. C.

WELLCOME, HENRY S.,
Snow Hill Bldg., London, Eng.

Weller, Franklin P.,
755 8th st., S. E., Washington, D. C.

Wells, James H., LL.B., Ph.G.,
Fifth ave. & Jackson st., Chicago, Ill.

Welsh, Henry,
Magnolia & St. Andrew sts., New Orleans, La.

Welsh, Joseph B.,
c. Paris Medicine Co., St. Louis, Mo.

Wendt, Wm. C.,
47 S. High st., Columbus, O.

Wentland, William Henry,
Drawer No. 248, Manor, Tex.

Werchshagen, Otto,
258 W. Biddle st., Baltimore, Md.

Werner, Louis,
914 Race st., Cincinnati, O.

Werner, Wm. F.,
2202 E. 10th st., Indianapolis, Ind.

Wesner, Henry C.,
Box 22, Windsor, Mo.

West, Chas. A.,
14 Fulton st., Boston, Mass.

West, John Robert, Jr.,
Tarpon Springs, Fla.

Westbrook, Chas. G.,
Lock Box 134, Newbern, Tenn.

Westcott, James W., Ph.G.,
Charles & Franklin sts., Baltimore, Md.

Westenfelter, Chas. W.,
37 E. Main st., Springfield, O.

Westheimer, David,
322 Central ave., Brooklyn, N. Y.

Westmoreland, Edwin R., Ph.G.,
Lockhart, Tex.

Wetterstroem, Caroline (Mrs.),
2844 Colerain ave., Cincinnati, O.

Wetterstroem, Theo. D., Ph.G.,
118 E. 6th ave., Cincinnati, O.

Weyrauch, James,
534 W. 18th st., Chicago, Ill.

Wheatcroft, John C.,
Grayville, Ill.

Wheeler, Albert A., Phar.D.,
1795 W. Grand Blvd., Detroit, Mich.

Wheeler, Carlton B.,
18 Main st., Hudson, Mass.

WHELPLEY, HENRY M., PH.G., M.D.,
2342 Albion Place, St. Louis, Mo.

Whidden, Ray Allen,
161 N. Franklin st., Chicago, Ill.

Whipple, Oscar Kellogg,
Broad & Fayette sts., Bridgeton, N. J.

White, Edw. R.,
Main st., Salisbury, Md.

White, Jennie Maguire,
416 Hayes st., San Francisco, Cal.

White, Joseph L.,
149 New Montgomery st., San Francisco, Cal.

White, Pinkney McGill,
1232 W. Lafayette ave., Baltimore, Md.

White, Walter H.,
39 S. Palifox st., Pensacola, Fla.

White, Wm. R., Ph.C.,
314 Hancock st., Nashville, Tenn.

Whitehouse, Harry,
Johnson City, Tenn.

Whitlock, William Thomas,
423 Riverside ave., Spokane, Wash.

Whitmore, Geo. C.,
601 Harrison ave., Leadville, Colo.

Whitney, David V., Ph.G.,
714 Wyandotte st., Kansas City, Mo.

Whitney, Minnie M. (Mrs.),
714 Wyandotte st., Kansas City, Mo.

Whitney, Robert Buckingham,
126 Willett st., Jamaica, N. Y.

Whittington, C. Emerson,
Gloster, Miss.

Whittington, Omar Harwell,
2513 N. Clark st., Chicago, Ill.

Whittle, Wm. A.,
4634 York Road, Baltimore, Md.

Whittlesey, Henry H.,
East Side Pharmacist, Pocatello, Idaho.

Whorton, Carl,
5th & Chestnut sts., Gadsden, Ala.

Wich, Henry E.,
1230 N. Stricker st., Baltimore, Md.

WICKHAM, WM. H.,
10 West 43rd st., New York, N. Y.

Widsig, T. J.,
6th & Washington ave., Newport, Ky.

Wiggin, Harry C.,
14 Fulton st., Boston, Mass.

Wilcox, Levi, Ph.B.,
145 Woodlawn Ter., Waterbury, Conn.

Wilder, Gaston H.,
510 23rd st., Galveston, Texas.

Wildman, Ernest Atkins,
620 E. 21st st., Indianapolis, Ind.
Wiles, Wood,
104 W. Walnut st., Bloomington, Ind.
Wiley, Harvey W.,
Cosmos Club, Washington, D. C.
Wilkerson, Jerome A.,
c. Missouri Athletic Association, 4th & Washington sts., St. Louis, Mo.
Williams, Edward,
Gay Bldg., Madison, Wis.
Williams, George Thomas,
Cor. High & Broad sts., Burlington, N. J.
Williams, John L.,
Doctor of Optics, P. O. Box 308, Three Rivers, Province Quebec.
Williams, Lawrence S.,
c. Morgan & Millard, 1300 N. Caroline st., Baltimore, Md.
Williams, N. Emery, Ph.G.,
508 N. Grand ave., St. Louis, Mo.
Williams, Sam A.,
Elm st., Troy, Ala.
WILLIAMS, SEWARD W., PH.C., F.C.S.,
5431 Cornell ave., Chicago, Ill.
Williamson, Harry Hays, H. S.,
U. S. N., U. S. S. Susquehanna, c. Postmaster, New York, N. Y.
Williamson, J. Otis,
Box 87, Montgomery, Ala.
Williamson, Thomas M.,
40 N. Market st., Frederick, Md.
Willman, Wm. G.,
Adams st., Brownsville, Tex.
WILSON, BENJ. O.,
19 Morse st., Newton, Mass.
Wilson, Clare A.,
c. Ahrens Drug Co., Bedford, Ia.
Wilson, Chas. F.,
Rushville, Ind.
Wilson, Lincoln,
3973 Tennyson st., Denver, Colo.
Wilson, Robert C.,
University of Georgia, Athens, Ga.
Wimmer, Curt Paul,
115 W. 68th st., New York, N. Y.
Windolph, J. Fred.,
Hayes st., Norwich, N. Y.
WINKELMANN, JOHN H.,
118 W. Lombard st., Baltimore, Md.
Winn, Howard Atkins, Ph.G.,
76 Park ave., Portland, Me.
Winski, Frank B.,
34 Woodland Pl., Stamford, Conn.
Winter, James H.,
1375 Valencia st., San Francisco, Cal.
Winter, William Patrick,
423 8th ave., S., Nashville, Tenn.
Winters, Arthur James,
605 N. Humphrey ave., Oak Park, Ill.
Wirth, Adam, Ph.M.,
5902 Hurst, cor. Elenore st., New Orleans, La.
Wirth, Rudolph,
158 West 99th st., New York, N.Y.
Wirthman, John G.,
31st & Troost ave., Kansas City, Mo.
Wirthman, Joseph C.,
31st & Troost ave., Kansas City, Mo.
Wise, James W.,
Dover, Del.
Wisner, Ebert H.,
508 Washington st., N. Valparaiso, Ind.
Witt, Charles T. A.,
2212 Sedgwick St., Chicago, Ill.
Wittkamp, Clarence T.,
25 Erkenbrecher ave., Cincinnati, O.
Witting, Fred F., Ph.G.,
Longmont, Colo.
Wittmer, Robert S. R.,
River ave. Pharmacy, River ave., Pittsburgh, Pa.
Woehner, Fred A.,
Drawer 1730, Great Falls, Mont.
Wolf, Chas. A.,
401 S. Broadway, Baltimore, Md.
Wolf, J. Carlton, Phar.D.,
401 S. Broadway, Baltimore, Md.

Wolf, Michael F.,
Eastern ave. & Chester st., Baltimore, Md.

Wolfe, Joseph Albert,
410 Chestnut st., Philadelphia, Pa.

Wolff, D. O.,
278 Dartmouth st., Boston, Mass.

Wolff, Edw. H.,
522 Washington ave., St. Louis, Mo.

Wood, Frank Davidson,
505 Beechurt ave., Morgantown, W. Va.

Wood, Horatio C., Jr., M.D.,
1905 Chestnut st., Philadelphia, Pa.

Wood, James P.,
2 Church st., New Haven, Conn.

Woods, Samuel R.,
110 S. Main st., Lamar, Col.

Woodworth, D. Olin,
122 W. 1st st., Albany, Ore.

Wooten, Thos. V.,
43–93 Leon st., Boston, Mass.

Wooten, Yandell Paul,
Lebanon, Tenn.

Wooyenaka, Keizo,
1021 Higashi-Nakano, Nakano, Toyotamagum, Tokio, Japan.

Worth, Thos. R.,
109 N. Main st., Sebastopol, Cal.

Worthington, John W. W.,
Pen Argyl, Pa.

Wrensch, Henry E., Jr., Ph.G.,
610 Bloomfield ave., Montclair, N. J.

Wright, Eugene Ware,
1625 Carr ave., Memphis, Tenn.

Wright, John Shepard,
3718 North Pennsylvania st., Indianapolis, Ind.

Wuensch, Henry Oscar,
515 Washington st., East Liverpool, O.

Wulling, Fred. J.,
Minnesota University, Minneapolis, Minn.

Wunderlich, Edw.,
1532 Dryades st., New Orleans, La.

Wurdach, John H.,
15 Grape st., Mount Olive P. O., Pittsburgh, Pa.

Wyckoff, Elmer E.,
246 E. 5th st., Brooklyn, N. Y.

Wyszynski, Walter H.,
8737 Commercial ave., South Chicago, Ill.

Xrques, Hypolite Rene,
1924 Esplanade, New Orleans, La.

Yates, Franklin B.,
159 Leonard st., New York, N. Y.

Yeager, Emery James,
1214 Heath st., Lafayette, Ind.

Yeargan, Reagan Lawrence,
Acme Drug Co., Harriman, Tenn.

Yongue, James Douglas,
Pickens, S. C.

Young, Andrew Palmerston,
153 Grand River ave., Detroit, Mich.

Young, Clarence C.,
735 Church st., Nashville, Tenn.

Young, Cyrus Homer,
2361 N. High st., Columbus, O.

Young, Fred. H.,
1759 Ainslie st., Chicago, Ill.

Young, Geo. O.,
Buckhannon, W. Va.

Young, Harry G., M.D.,
309 Harrison ave., Avalon, Pa.

Youngken, Dell Wallace,
Military Medical Detachment, 56th Infantry Regt., Chattanooga, Tenn.

Youngken, Heber W., Ph.G., A.B., A.M.,
456 Winona ave., Germantown, Pa.

Zacovic, Andrew,
46 Collins ave., Uniontown, Pa.

Zamora, Manuel,
913–915 Sebastian st., Manila, P. I.

Zeamer, Harry W.,
240 Locust st., Columbia, Pa.

Ziegler, Washington Hayne,
c. Medical Coll. of S. C., 213 Rutledge ave., Charleston, S. C.

Zeluff, Irvin Simpson,
743 Ocean Vilm ave., Woodhaven, L. I., N. Y.

Zickes, Elmer Joseph,
4521 Clark ave., S. W., Cleveland, O.

Ziefle, Adolph,
Oregon Agriculture College, Corvallis, Ore.

Zieg, John,
35 Second st., San Francisco, Cal.

Ziegler, Howard P.,
201 Windsor st., Reading, Pa.

ZIEGLER, PHILIP M.,
526 Penn st., Reading, Pa.

Zieske, Arthur, Ph.G.,
214 1st ave., S. W., Watertown, S. D.

Zimmerman, Theophilus,
Rose Free Dispensary, 7th & Cherry sts., Terre Haute, Ind.

Zink, Edward,
203 Fulton st., New York, N. Y.

Zinn, Charles E.,
2600 E. 31st st., Kansas City, Mo.

ZOELLER, EDW. V.,
Main st., Tarboro, N. C.

Zonies, Nathan,
29th & Diamond sts., Philadelphia, Pa.

Zottman, Wm. H.,
1 Church st., Burlington, Vt.

Zuck, F. J.,
1028 Missouri st., Lawrence, Kans.

Zuenkeler, John F., Ph.G.,
2815 Highland ave., Cincinnati, O.

Zwick, Mary Hall (Mrs.),
511 S. Humphrey ave., Oak Park, Ill.

GEOGRAPHICAL ROLL OF MEMBERS.

HONORARY MEMBERS.

FOREIGN COUNTRIES.

ENGLAND.

E. M. Holmes, F.L.S., *London*, 1899.
Henry George Greenish, *London*, 1913.
David Hooper, F.I.C., F.C.S., *Weston*, 1899.

GERMANY.

Dr. Arthur Meyer, *Marburg*, 1910.
Dr. Herman Schelenz, *Cassel*, 1912.
Dr. Ernst Schmidt, Geh. Regierungsrath, *Marburg*, 1899.

SWITZERLAND.

Dr. Heinrich Zoernig, *Basel*, 1916.
Dr. Alexander Tschirch, *Berne*, 1910.

ACTIVE MEMBERS.

(List corrected to Feb. 1, 1918.)

Members are requested to report any inaccuracies in these lists, and to notify the General Secretary and Treasurer of all changes of address.
(The names of Life Members in Capitals. Names of Life Members under the old Constitution in *italics*.)

UNITED STATES OF AMERICA.

ALABAMA.

Anniston.
Spearman, J. F..... 1918

Auburn.
Blake, Lynn Stanford..... 1914
Toomer, S. L..... 1918

Camp Sheridan.
Lundgren, Sgt. Rudolf..... 1913

Decatur.
Loyd, Elmer S..... 1916

Ensley.
Gale, E. E..... 1918
Walker, Chas. Robert..... 1918

Gadsden.
Vance, Winfield Scott..... 1909
Whorton, Carl..... 1908

Guntersville.
Thomason, William Pearce..... 1910

Lineville.
Rudd, Cicero..... 1914

Milby.
Guice, John Luther..... 1918

Mobile.
Demony, Marshall J..... 1915
Eichold, Bernard Herbert..... 1905
Van Aller, Thomas S..... 1907
Van Antwerp, James Callanan.. 1905

Montgomery.
Williamson, J. Otis..... 1914

Phoenix City.
Morgan, David Elias, Dr..... 1918

Prattville.
Scott, Clarence Alexander..... 1905

Talladega.
McDiarmid, Daniel Palmer..... 1909

Troy.
Williams, Sam. A..... 1914

Tuscaloosa.
Bingham, William Ellison, A.B., Univ. of Miss..... 1909

Tuskegee.
Lewis, Lawrence Campbell..... 1910

ALASKA.

Anchorage.
Loussac, Zachary Joshua..... 1916

Douglas.
Smith, Guy Livingstone..... 1909

Juneau.
Britt, William E..... 1916

ARKANSAS.

Camden.
MORGAN, AYLMER LEE..... 1890

Fort Smith.
Sparks, James Mitchell..... 1894

Helena.
Draper, Thomas J..... 1914

Hope.
Gibson, John Sceva..... 1908

Hot Springs.
Eisele, Martin Augustine..... 1907
Lehman, Charles Walter, A.B... 1907

Jasper.
Arbaugh, Rufus C., Ph.G..... 1912

Little Rock.

Hodges, Jesse D..... 1915
Schachleiter, Frank..... 1917
Snodgrass, Latta Kavanaugh... 1901

Piggott.

Potter, Maynard H., Ph.G., Ph.C..... 1906

Pine Bluff.

DEWOODY, WILLIAM LAWRENCE.. 1887

Stuttgart.

Webb, John W..... 1913

Warren.

Appleton, William Riley..... 1901
Davis, A. T..... 1914

CALIFORNIA.

Alhambra.

Moore, William Irwin..... 1917

Arcata, Humboldt Co.

Keller, William Otto Emanuel.. 1908

Auburn.

Stevens, Frederick Solon..... 1903

Bakersfield.

Hughes, James A..... 1909

Berkeley.

Laughlin, Carlisle..... 1915
Lea, E. J..... 1918
Luck, Julius Alex. W..... 1910
Mueller, Fred..... 1915
Schmidts, Carl L..... 1917
Warner, William James..... 1913

Corona.

Schaak, Milton Franklin..... 1906

Eureka.

Bohmansson, Robert Hugo..... 1901
Correll, Eugene Philip..... 1909

Fort McDowell.

Hamner, James Ferris..... 1906

Fortuna.

Bowman, Reginald Hamilton.... 1909

Fresno.

Lich, Robert..... 1917
Smith, Geo. Henry..... 1909

Fruitvale.

Philip, Waldemar Bruce, Ph.G., Phar.D..... 1907

Glendora.

DAWSON, JOHN HENRY, PH.G... 1882

Half Moon Bay.

Morgan, Charles Levin..... 1915

Huntington Park.

Lenocker, Wm. Paul..... 1916

Los Angeles.

Binz, Edward Gabriel..... 1909
Cordivenus, W. M..... 1915
Guest, Wilbert Hillman..... 1909
Henderson, Edward A..... 1918
Howard, Fletcher (Mrs.)..... 1905
Maas, Arthur R..... 1916
Reilly, Robert C..... 1901
Sauvinet, Charles D..... 1902
Schiff, Ludwig..... 1912
Stabler, Lavid J..... 1915
Thurston, Emory W..... 1915
Watters, Alexander John..... 1909

Mountain View.

Wagner, Louis..... 1908

Oakland.

Cheatham, Wm. B..... 1917
Enke, Albert A..... 1917
Leet, Robert Andrew..... 1907
Varney, Edward Francis..... 1892

Orland, Glenn Co.

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Leavitt, Adoniram Judson..... 1905

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Dyna, Carl Frederik Julius, Ph.G..... 1909

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Hereth, Frank Samuel..... 1893

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Porter, G. Ellis, A.B..... 1909

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Kirk, H. S..... 1913
Lichthardt, George Henry Philip, Ph.G..... 1902

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Hund, George Bernard..... 1910

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Strahlmann, Edward..... 1909

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Baer, Edward Arthur..... 1907
Bandell, Chas. Marion..... 1917
Becker, Harry Vogel..... 1915
Carey, Henry B..... 1909
Dickens, Paul Frederick, H. S., U. S. N..... 1917
Fletcher, David M..... 1904
Flint, John Henry..... 1909
French, Leon Hermann..... 1917
Green, Franklin Theodore..... 1908
Harris, Samuel J., Sgt. H. C., U. S. A..... 1912
Headen, Claude Thomas, Ph.C. 1909
Hudgins, Wiliford Carl..... 1915
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Jorgenson, Edward B..... 1902
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Lengfeld, Joseph Louis..... 1909
Nish, Frederick William..... 1916
Pfirter, William Edward, Ph.G.. 1917
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Prior, Toney..... 1905
Roehr, Clarissa May (Miss)..... 1908
Schmidt, Valentine, B.S., M.S., M.D., Ph.D..... 1887
Schneider, Albert, B.S., M.S., M.D., Ph.D..... 1899
Sharp, Solomon A..... 1902
Simmons, Haydn Mozart..... 1915
Smith, Henry Lees..... 1915
Troxler, Robert Fulton..... 1915
White, Jennie M..... 1914
White, Joseph Leyden..... 1909
Winter, James Henry..... 1904
Zieg, John..... 1912

Sanger.

Brehler, Oscar August..... 1909

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Coit, Anthony C..... 1915
Doerr, Louis..... 1917
Dore, Cornelius W..... 1915
Munson, James Grant..... 1908
Pellerano, Nicholas Andrew..... 1909
Smith, C. H. D..... 1917

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Thomas, Tony B..... 1916

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Furnish, B..... 1917

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Patterson, James Numa..... 1916

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Sebastopol.

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Farrell, Anna Marie (Miss)..... 1914

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Van Liew, William Kirk..... 1913

Boulder.

Beckmann, Agnes Pauline..... 1918
Fine, Eben Givens..... 1913
Loomis, Russell Newton..... 1918
Perusse, Francis Joseph..... 1915

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Davies, Llewellyn Powell..... 1891

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Meyer, Walter Ferdinand..... 1913

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Alkire, Lewis L..... 1908
Becker, Maxwell M..... 1915
Best, John..... 1866
Beukma, William..... 1913
Charles, Corlis Duffy..... 1913
Chedister, Percy A..... 1916
Clark, Alfred William..... 1908
Clarke, Stanley C..... 1917
Clayton, Charles J..... 1905
Cordes, Henry..... 1913
Cutler, Ira E..... 1917
Earnest, Julius Fischer..... 1917
Engle, Wilber Dwight..... 1917
Givens, Milton P., Jr..... 1915
Hensel, Samuel Theodore, Ph.G. 1913

Hover, William Adgate..... 1895
Hover, William Tracy..... 1913
Jeancon, Louis Augustus..... 1912
Lord, Frank Jotham..... 1912
Martin, John Albert, Jr..... 1917
McKenzie, Robert Henry, Ph.G. 1908
Pillsbury, Arthur Lee..... 1914
Ryan, Alonzo S..... 1913
Scholtz, Edmund L..... 1909
Scholtz, William O..... 1913
Secheverell, Hugh Bennett..... 1913
Swoboda, Adolph..... 1909
WALBRACH, ARTHUR..... 1881
Watson, Robert Gordon..... 1916
Wilson, Lincoln..... 1910

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Scott, Alexander Weir..... 1906

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Mathews, Elmo D., Sgt. 1st Cl. H. C., U. S. A..... 1912

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Palmer, William Gordon..... 1909

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Dow, John Peter..... 1904

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Woods, Samuel Ross, Ph.G..... 1913

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Kolsch, Harry..... 1916
Whitmore, George Comings.....1912

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Witting, Frederick Frank, Ph.G. 1902

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Schenck, Fannie K. (Mrs.)..... 1906

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Stroup, A. L..... 1916

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Anacostia.

Weiss, Conrad Henry..... 1900

Washington.

Alsberg, Carl L., A.B., A.M., M.D..... 1912
Beall, Herbert Ninian..... 1915
Bradbury, Wymond Henry, Phar.D..... 1895
Brown, Clark L..... 1911
Davis, William E..... 1916
DuMez, Andrew Grovor..... 1915
Finley, Lloyd Bruce..... 1916
Flemer, Lewis..... 1895
Fuller, Henry Corbin..... 1915
Garrels, Charles..... 1914
Gibson, Frank L..... 1904
Henry, Frank Clinton..... 1894
HILTON, SAMUEL LOUIS, PHAR.D. 1890
Kalusowski, Henry E..... 1904
Kebler, Lyman Frederic..... 1894
La Grange, John V., A.M., Ph.G. 1905
Mayo, Redmond..... 1918
Megaw, Herschel..... 1917
Merrill, Edward C..... 1914
POWER, FREDERICK BELDING.... 1872
Quigley, Richard Lucien..... 1902
Rabak, Frank..... 1905
Richardson, Willard Stowell.... 1900
Scott, Edgar Burroughs..... 1905
Sievers, Arthur..... 1906
Spire, William Barton, Phar.D.. 1908
Stockberger, Dr. Warner W.... 1914
Vane, Patrick P..... 1911
Viehoever, Arno, M.D..... 1915
Waters, Morris Wilson..... 1915
Weller, Franklin Pierce..... 1900
Wiley, Harvey Washington..... 1902

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Bridgeport.

Damtoft, Knud J..... 1916
Jamieson, George Alexander.... 1903
Leverty, John Augustine..... 1900
Ostrofsky, Frank Joseph..... 1910
Poczos, Joseph..... 1916
Snyder, Alfred Harrington..... 1915

Derby.

Purdy, Harrison E..... 1916

Hartford.

Bienstock, Samuel..... 1916
Gladding, Curtis Parsons..... 1912
Gorman, Chas. F..... 1916
Hockert, Bruno E..... 1916
Rapelye, Charles A..... 1915

Meriden.

Pink, Charles H..... 1916

Middletown.

PITT, JOHN RICHARD..... 1872

New Haven.

GESSNER, EMIL ADOLPH..... 1878
Jenkins, Edward H..... 1913
Spalding, Clarence Gilman..... 1910
Wood, James Prior..... 1890

Norwalk.

Glendering, Harold..... 1915

Norwich.

Lerow, Herbert M..... 1916
Utley, Albert T..... 1916

Simsbury.

Lathrop, Arthur E..... 1910

Southport.

Switzer, Luin Burt..... 1916

Stamford.

Weicker, Theodore..... 1905
Winski, Frank B..... 1916

Stratford.

Brill, Frederic Bernhard..... 1916

Waterbury.

Newton, Clark H. W..... 1916
Wilcox, Levi, Ph.B..... 1903

Watertown.

Sullivan, Daniel George..... 1916

Willimantic.

Cartier, Gustave O..... 1913

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Clayton.

Keys, Walter R..... 1915

Dover.

Wise, James W..... 1916

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Elliott, Charles S..... 1914

Georgetown.

Rose, William Wilson..... 1918

Newark.

Rhodes, George W..... 1915

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Brooksville.

Lemasters, William Otterbein... 1905

Daytona.

Clark, Aaron P. (Mrs.)..... 1914
Seaman, Frederick Anthony.... 1905

De Land.

Fisher, George Washington..... 1893

Jacksonville.

Jones, William D..... 1913
Mahoney, Wilber Alexander.... 1916
Stewart, Harry E..... 1913

Key West.

Miller, Charles..... 1897

Miami.

Perry, Wm. George..... 1918

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Ramsaur, David Wilfong..... 1902

Pensacola.

D'Alemberte, Herbert Harry.... 1915
Gahn, Henry..... 1902
Hannah, Malcolm E..... 1914
Owen, Charles Herbert..... 1916
Petterson, Ernest Wilhelm..... 1905
White, Walter H..... 1918

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Smith, Isaac Clifton..... 1913

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Jerger, Henry Louis, Jr..... 1915

Tallahassee.

Henry, Arthur Malcolm, B.S.... 1913

Tampa.

Berger, Ernest..... 1902
Hale, Leon P..... 1918
Monroe, Harley R..... 1916

Tarpon Springs.

West, John Robert, Jr..... 1916

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Wilson, Robert C..... 1915

Atlanta.

Cox, Eugene H..... 1916
Gilbert, Cyrus Thurston..... 1913
Jacobs, Sinclair Sartorius..... 1915
Payne, Dr. George Frederick.... 1893

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Augusta.

Land, Robert Henry, Jr..... 1902

Macon.

Martin, Albert E..... 1914
Morris, Max, Ph.G..... 1898

Savannah.

Rowlinski, Robert Antone..... 1892
Solomons, Isaiah Abraham..... 1894
Solomons, Isaiah, Jr..... 1913

Thomasville.

Eidson, Frank Vinton..... 1917
Mash, Henry Terrell, Jr..... 1917
Thomas, Robert, Jr..... 1888

Valdosta.

Newberry, Denver Douglas.....1918

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Agana.

Elliott, Hiram Wilson..... 1916

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Honolulu.

Smith, George Waterman..... 1915

IDAHO.

Boise.

Ballou, Clarence Orlando..... 1909

Oakley.

Quillian, Walter W..... 1916

Pocatello.

Buehler, John J..... 1913
Whittlesey, Henry Hawley..... 1910

Twin Falls.

Berry, Everly Nelson..... 1917
Spargur, Roy Miles..... 1910

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Frauenhoff, Frederick Louis, Ph.G..... 1909
Standt, Louis Carl, Ph.G..... 1890

Batavia.

Schreiner, Albert..... 1914

Beardstown.

Denton, William S..... 1916

Cairo.

Schuh, Herman C..... 1916
Schuh, Paul Gustav..... 1894

Canton.

Everley, Ray Emanuel..... 1916
Webster, Richard C..... 1914

Carlinville.

Graham, Frank William..... 1916

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Ackermann, Albert George, Ph.G..... 1909
Adamick, Gustave Hattenhauer. 1891
Altstadt, Benjamin W..... 1917
Avery, Charles Hamilton..... 1905
Backus, Edwin John..... 1913
Baker, Samuel Leon..... 1915
Bartlett, James E..... 1906
Bate, Henry John..... 1906
Beavo, Mabel S. (Mrs.)..... 1918
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Blocki, John..... 1909
Bodemann, Wilhelm..... 1906
Boehm, John J..... 1905
Bruder, Otto E..... 1905
Brunn, Harold Nichalai..... 1905
Burda, Stanislaus W..... 1916
Burdick, Alfred S., M.D..... 1913
Burdick, Merle M..... 1913
Buss, Oliver C..... 1915
Caldwell, A. C..... 1915
Canham, George E..... 1915
Christensen, Henry C..... 1906
Chwatal, John J..... 1916
Clark, Albert Henry, Ph.G..... 1905
Combs, Delta E..... 1911
Craig, Hugh..... 1907
Crowley, James Patrick..... 1908
Datz, Charles Percival..... 1916
Day, William Baker, Ph.G..... 1895
DiCosola, Anthony..... 1916
Druehl, Amanda Stahl..... 1916
Dubsky, Frank J..... 1918
Eicher, B. L..... 1915
Elisburg, Louis A..... 1913
Fantus, Bernard, M.D..... 1908
Fenger, Frederic..... 1910
Fry, Herman..... 1902
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Gazzolo, Frank Henry..... 1917
Gordin, Henry Mann, Ph.D.... 1899
Gordon, Jean (Miss)..... 1914
Gray, Margaret McClintock (Mrs.)..... 1901
GRAY, WILLIAM..... 1892
Green, Charles..... 1917
Haeseler, Loren M..... 1906
Hartwig, Otto Julius..... 1892
Hellmuth, Joseph Anthony..... 1905
Henry, Samuel Clements..... 1909
Hermanek, Joseph Charles..... 1904
Hilpert, Willis Stose..... 1908
Holthoefer, Herman John..... 1912
Hood, Harry Alling..... 1910
Hoover, George William..... 1905
Hottinger, Otto George..... 1910
Humma, Henry Hermann..... 1917
Hunsche, Frederick..... 1915
Jehlik, Anton Josef..... 1906
Josenhans, Reinhardt, C. J., Ph.C..... 1907
Kaplan, Samuel Solman..... 1918
Keim, Raoul D..... 1916
Kraemer, George Charles..... 1913
Ladish, Erich Herman..... 1905
Larsen, L. P., Ph.G..... 1908
Light, Isam M..... 1918
Lindh, Berger..... 1918
Loesch, William, Ph.G..... 1912
Mares, Frank Martin, Ph.G.... 1902
Matthews, Charles Edward..... 1893
Mawrence, Israel..... 1916
McCauseland, Harloven H..... 1913
Mentz, Otto Herman..... 1916
Meyer, Frederic Hugo 1907
Miller, Albert, Ph.G..... 1907
MINER, MAURICE A., PHAR.M.. 1880
Morrisson, James William..... 1912
Mrazek, Leo Ludwig..... 1914
Olmstead, David M., Ph.C..... 1916
Orr, Charles C..... 1915
Patterson, Charles Waggener... 1905
Patterson, Theodore Henry..... 1869
Peckham, Wm. G..... 1916
Potts, Thomas Humphreys..... 1906
Puckner, William August, Ph.G., Phar.D..... 1888
Rauschert, Emil P..... 1918
Rhode, Rudolph Ernst..... 1887
Riemenschneider, Julius H..... 1915
Roessner, Walter C..... 1915
Roman, Miguel Angel..... 1917
Ruder, Rose Scheele (Mrs.)..... 1918
Sass, Stephen Konrad..... 1905
Schapper, Ferdinand C..... 1913
Scherer, Andrew, Ph.G..... 1884
Schmid, Rose Phillipus..... 1911
Schmidt, Frederick Michael, Ph.G..... 1887
Schobert, Rudolph Johannes... 1918
Searle, C. H..... 1918
Secord, George Louis, M.S., Phar.D..... 1910
Shapiro, Leo Harold..... 1917
Sheblessy, Michael Albert..... 1909
Shippy, Earl F..... 1917
Snow, Clyde Mason, Ph.G., M.A..... 1903
Snow, Herbert Waldemar, Ph.C. 1912
Snyder, Forrest Omo..... 1915
Snyder, William Edward, Ph.G.. 1909
Stadelmann, Harry Edgar..... 1909
Stecker, Henry F..... 1918
Stephen, Otto Paul, Ph.G..... 1909
Storer, Charles Adelbert..... 1906
Stout, Marion Alphon, Ph.G.... 1906
Stuchlik, John..... 1913
Tabenski, Longin, Ph.G., M.D.. 1915
Trienens, Joseph..... 1915
Umenhofer, Adolph..... 1908
Vahlteich, Hans Walter.....1918
Van Schaack, Cornelius Peter.. 1905
Vaupell, George F., Ph.C..... 1915
VOISS, ARCADIUS..... 1901
Von Hermann, Eugene..... 1918
Vorsanger, Lillian..... 1915
Wells, James Herbert, Ph.G., LL.B..... 1908
Weyrauch, James..... 1916
Whidden, Ray Allen..... 1918
Whittington, Omar Harwell.... 1915

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Witt, Charles T. A..... 1916
Young, Fred H..... 1913

Cicero.

Slepicka, Irvin Miles..... 1917

Clayton.

Watson, Elmer A..... 1915

Danville.

Baum, William Franklin..... 1915

Du Quoin.

Bianco, Mike Robert..... 1915

East St. Louis.

Skye, Francis Josephus..... 1918

Elgin.

Schultz, Charles Frederick Wm. 1911

Evanston.

Doolittle, Roscoe Edward, B.S.. 1909
Lee, John Victor..... 1910

Fairmount.

Tilton, Claude Enoch..... 1905

Forest Park.

Jacob, Charles William..... 1914

Freeport.

McNess, Frederick Wm., P.D... 1906

Geneseo.

Stamm, Dante Milton..... 1896

Girard, Macoupin Co.

Deck, Lewis Cass..... 1901

Golconda.

Paris, James Ernest..... 1908

Grayville.

Wheatcroft, John Christopher.. 1912

Great Lakes.

Bote, Lester Elmer..... 1916
Crain, George Lawrence..... 1916
Dean, Corliss Page, H. S., U. S. N..... 1917
Gronau, Arthur P..... 1918
Link, Alexander J..... 1917
Ludwig, Frederick, M.D..... 1916

Greenup.

Conzet, Rufus Warren..... 1904

Harrisburg.

Gregg, Thos. D..... 1914

Highland Park.

Gsell, Earl W..... 1917

Jacksonville.

Armstrong, Byron..... 1917

LaSalle.

Clancy, William J..... 1915

Mascoutah.

Dauber, Curt Louis..... 1913

Moline.

Anderson, Adolph Emil..... 1913
Brunstrom, Charles, Ph.G..... 1912
Lindvall, Charles Gustaf..... 1897
Sohrbeck, George Henry..... 1888
Sohrbeck, George Wm., Ph.G... 1897

Mt. Sterling.

Thoroman, Ralph R..... 1916

Mt. Vernon.

Collins, George Wm..... 1911

Oak Park.

Gram, Wm. J. B..... 1918
McCauley, Charles Edward.... 1903
Winters, Arthur James..... 1916
Zwick, Mary Hall (Mrs.)..... 1914

Ottawa.

Duncan, Wm. D..... 1918
Lutz, Carl Wm..... 1918

Peoria.

Benton, Wilbur Merritt..... 1888
Eichenberger, William Samuel.. 1916
Kimlel, J. Edward..... 1915
Schmidt, A. Elsa..... 1918
Weinkauff, Jacob..... 1914

Pesotum.

Hoffmann, George Frederick, Ph.G..... 1902

Quincy.

Dickhut, Lawrence August, Ph.G..... 1910
Hagemann, William Herman, Ph.G..... 1910
Heidbreder, Albert Henry..... 1905

Rock Island.

Hartz, William Theodore..... 1909

Rosiclare.

Paris, William John James..... 1913

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Salem.
Sweeney, A. J..... 1911

South Chicago.
Wyszynski, Walter H..... 1916

Springfield.
Dodds, Frederick Clinton..... 1918
Dodds, Richard Newton..... 1902
Metzger, Fred W..... 1916
Sister Theresa..... 1917

Stronghurst, Henderson Co.
Harter, Isaac Foster, M.D..... 1893

Tuscola.
Stacy, Marion Franklin..... 1903

Urbana.
Beal, George Denton..... 1907
Beal, James H., Sc.D., Phar.D.. 1892
Creighton, Mary L. (Miss)..... 1903

Waukegan.
Breves, Rudolph..... 1916

INDIANA.

Akron.
Dawson, Byron F..... 1909

Albion.
Bidwell, Charles..... 1917
Miller, Chas. Elliott..... 1899

Angola.
Sherrard, Charles Cornell..... 1893

Bloomington.
Wiles, Wood..... 1914

Bourbon.
Martin, Joel F..... 1918

Broad Ripple.
Taylor, Irvan E..... 1917

Converse.
Gift, Wendell J..... 1913

Crown Point.
Scheddell, Wm. Allen..... 1918

Elkhart.
Beardsley, Andrew H..... 1913

Evansville.
Bohn, George W..... 1907
Brown, George Wilton..... 1914
Hardigg, William L..... 1913

Ft. Wayne.
Emanuel, Julia Esther (Miss)... 1918

Gary.
Meyer, Frank B..... 1918

Indianapolis.
Anderson, Charles Wm..... 1918
Barnard, Harry E..... 1918
Bartholomew, William C..... 1913
Bibbins, Francis Eugene, Ph.G.. 1909
Blodau, Robert P..... 1908
Borst, Harry J..... 1917
Bye, Mortimer..... 1916
Caperton, Woods A..... 1916
Carter, Edgar B..... 1916
Carter, Frank Henry..... 1891
Carter, Harlen Wilson Searight.. 1913
Davis, Howard R..... 1916
Donaldson, John W..... 1915
Eberhardt, Ernest Godlove, Ph.G..... 1906
Eckler, Charles Ralph..... 1903
Eldred, Frank Randall..... 1905
Etter, Robert B..... 1917
Federer, Francis A..... 1915
Fisk, Frank Byron..... 1916
Gray, Harold..... 1918
Hargreaves, Chester Chas..... 1918
Hoff, Karl Wm..... 1917
Huder, Henry J..... 1894
Hurty, John Newell, M.D., Phar.D..... 1882
Jamieson, Walter Albert..... 1918
Jopling, John Clark..... 1916
Kassulke, August..... 1905
Keene, Bernard M..... 1918
Koch, Edward Wm..... 1918
Lawson, Chas. E..... 1916
Leth, Eric Gunnar..... 1916
Lilly, Eli..... 1906
Lilly, Josiah Kirby..... 1890
Lilly, Josiah Kirby, Jr..... 1916
Lynn, Charles Jackson..... 1906
Miller, Ivy Lowell..... 1912
Mooney, Wm. J..... 1916
Morgan, Ralph Waldo..... 1916
Mueller, Ferdinand A..... 1916
Mueller, J. George..... 1906
Niles, Edward Hulbert..... 1914

Noel, Harry Sumner..... 1917
Parker, Mayne E..... 1915
Parmelee, Harold L..... 1916
Pfafflin, Henry Adolph..... 1892
Pruyn, Murry K..... 1912
Reahard, Ralph McDonnell..... 1916
Reick, Edward C..... 1918
Rhodehamel, Harley Wesley..... 1916
Samper, Julio, M.D..... 1918
Schwartz, Maurice Paul..... 1906
Schwarz, Leonard J..... 1918
Seybert, John Edward..... 1916
Showalter, Ralph W..... 1913
Smith, Herbert Alexander..... 1917
Stocking, Charles Howard..... 1914
Stokes, John Wesley..... 1917
Stucky, Edward W., Ph.B, A.M., 1908
Tanke, Clayton E..... 1917
Thorburn, Albert David..... 1902
Vestal, John Wilfred..... 1916
Warner, Cortice M..... 1916
Watkins, Charles William..... 1907
Werner, William F..... 1908
Wildman, Ernest Atkins..... 1917
Wright, John Shepard..... 1916

Kouts.

Benkie, John Gottlieb..... 1910

Lafayette.

Best, Frank Merrell..... 1914
Gidley, William Francis, Ph.C., B.S..... 1910
Jordan, Charles B., Ph.C., B.S., M.S..... 1909
Lee, Charles O..... 1915
Schultz, John Jacob..... 1904
Yeager, Emory James..... 1918

La Porte.

Meissner, Frederick William, Jr., Ph.G..... 1890

Ligonier.

Eldred, Samuel T..... 1918

Logansport.

Hoffmann, George William..... 1904

Martinsville.

May, Edwin W..... 1914

Mt. Vernon.

Adams, Clarence Herman..... 1916

Muncie.

Weaver, Robie Rolland, Ph.G.. 1916

Notre Dame.

Green, Robert Lee..... 1906
Rodriqueza, Rene..... 1918

Rushville.

Wilson, Charles Frazee..... 1906

Salem.

Rudder, William Hiram, Ph.G.. 1907

Seymour.

Loertz, Carl Edward..... 1907
Osterman, Henry..... 1914

South Bend.

Reyer, Emil, Ph.G..... 1907

Terre Haute.

Zimmerman, Theophilus..... 1914

Tipton.

Porter, Jesse G..... 1915

Troy.

Gaesser, Theobald Theodore, Ph.G..... 1901

Union City.

Tibbetts, Wm. Harris..... 1918

Valparaiso.

Heinemann, Albert F..... 1905
Roe, Joseph Newton..... 1902
Speer, William O..... 1915
Timmons, George Demming, Ph.G., B.S., Ph.C..... 1905
Wisner, Ebert H..... 1914

Warren.

Hickerson, William Henry..... 1894

West Lafayette.

Borders, Glenwood..... 1916
Hess, Leon Ralph..... 1916

West Terre Haute.

Cassady, Burton..... 1909

IOWA.

Albia.

Gross, E. Orville..... 1916

Algona.

Falkenhainer, Albert..... 1916

Amana.

Miller, Frederick William..... 1902

IOWA—KANSAS.

Ames.

Bergren, Elvin R..... 1916
Judisch, George..... 1913

Anthon.

McNiff, Frank J..... 1915

Audubon.

Frick, Daisy Adelaide..... 1914

Bedford.

Wilson, Clare A..... 1916

Burlington.

Sutter, Joseph R..... 1915

Callendar.

Larson, Martin..... 1906

Cedar Rapids.

Meister, Edward James..... 1918

Clear Lake.

Etzel, John Leonhardt..... 1897

Clinton.

John, Milo Jesse..... 1910

Davenport.

BALLARD, JOHN WINTHROP, PH.G..... 1871
Burnside, Carl Bishop..... 1913

Denison.

Schlumberger, Anna Babette... 1913
Schlumberger, Philip August.... 1911

Des Moines.

Berner, Carl Albert..... 1903
Ellyson, G..... 1916
Hansen, William B..... 1917
Heidenreich, Arthur C..... 1916
Kagy, Elbert O., Ph.G., Ph.C... 1913
Weeks, Carl..... 1915

Dubuque.

Falkenhainer, Chas..... 1918

Fayette.

Davis, Frank J..... 1918

Ft. Dodge.

OLESON, OLAF MARTIN..... 1877

Ft. Madison.

SCHAFER, GEORGE HENRY..... 1871

Holstein.

Watts, Thomas McCoy..... 1916

Hull.

Coad, William A..... 1911

Iowa City.

BOERNER, EMIL LOUIS..... 1877
Cooper, Zada Mary (Miss), Ph.G. 1909
Doden, Herbert F..... 1909
Konantz, William A..... 1916
Keuver, Rudolph A., Ph.G., Ph.C. 1912
Teeters, Wilber John..... 1902

Irwin.

Pexton, Frederick Schuyler..... 1915

Keokuk.

Kiedaisch, George Arthur..... 1904

Lowden.

Jurgensen, Peter H., R.Ph..... 1911

Maquoketa.

Staack, Hugo F..... 1915

Marshalltown.

Mayer, Peter..... 1906

McClelland.

Jones, Harrie..... 1915

Muscatine.

Halstead, Alice Louisa (Mrs.)... 1892

Red Oak.

Casey, D. W..... 1915

Sioux City.

SCHERLING, GUSTAV, PH.G..... 1884
Soper, George M..... 1909
Thompson, Edwin Thomas..... 1913
Todd, Joseph A..... 1914
Toller, Adolph J..... 1915

Winfield.

Lindley, John Milton, Phar.D.. 1901

KANSAS.

Atchison.

Noll, Mathias..... 1918

Columbus.

Powell, Byrd Oscar..... 1916

Ellsworth.

Sherriff, Wm. Ebenezer..... 1904

Harveyville.

Dunn, Preston..... 1916

Havana.

Lindley, Patrick H.....1913

Humboldt.

Hess, Walter Isadore..... 1913

Lawrence.

Blaylock, Fred Orville..... 1916
Havenhill, L. D..... 1900
LEIS, GEORGE..... 1869
Moore, John Thomas..... 1888
Sayre, Lucius Elmer..... 1883
Sterling, Charles Morgan, A.B.. 1911
Varnum, Walter Howard..... 1912
Watson, George Nathaniel..... 1910
Zuck, F. J..... 1916

Lucas.

McEckron, George Milton..... 1916

Marysville.

Riesen, David V..... 1909

Ottawa.

Dorsey, Maurice Edward..... 1916

Overbrook.

Topping, Arthur Ellsworth, Ph.G..... 1904

Salina.

Ekstrand, Francis Warner..... 1916

Wichita.

Chism, John Samuel, Ph.G..... 1909
Delhotel, Charles Earle..... 1916
Fields, J. Larkin..... 1915
Frazier, William John..... 1909

Winfield.

Bird, Richard B..... 1910
Friedenburg, Maximillian Wilmer 1904

KENTUCKY.

Anchorage.

Haeusgen, Henry Otto..... 1915

Augusta.

Bertrams, Henry..... 1914
Harvie, Roy Longueville, Ph.G. 1917
Smith, Edwin, Ph.G..... 1917

Covington.

Eichler, Henry..... 1913
Hauser, Chas. A..... 1918
Pieck, Edward Ludwig..... 1897

Frankfort.

Averill, Thomas P..... 1915
Gayle, John William..... 1891

Hawesville.

Patterson, George Orville..... 1907

Henderson.

Elam, John Thomas..... 1907

Lexington.

Brown, Linwood Arnold, Ph.C., Phar.D..... 1909
Harting, Rudolph R..... 1902

Louisville.

Buschemeyer, Henry..... 1909
Dilly, Oscar Charles..... 1888
Dimmitt, Addision..... 1895
Frick, Robert J..... 1915
Hulskamp, Clara C..... 1918
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Mueller, Otto Edward..... 1907
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Votteler, William..... 1895

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Greule, Albert Martin..... 1903
Hoyer, Benjamin..... 1916
Widsig, T. J..... 1915

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Danhauer, William Edward..... 1914

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Calderone, Frank Joseph..... 1917
Rupp, Peter..... 1915

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Rieger, Frank Godfrey..... 1916

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Eleazar, E..... 1918

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Guess, John Eitel..... 1916

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Segura, Jacob S..... 1917
Taylor, John Richardson..... 1915

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Clay, Cassius Lovelace..... 1918
Freund, Paul..... 1917
Godbold, Fabius Chapman..... 1887
Grace, Robert F..... 1914
Kaczoroski, Adolph O..... 1909
Legendre, Joseph Amilcar..... 1891
Lyons, Lucien Eugene..... 1904
Metz, Abraham Lewis..... 1887
Mouledons, Andrew D., M.D... 1915
Nuccio, Frank Joseph..... 1918
Purel, Victor Honore..... 1918
Richards, Henry Cook..... 1917
Samson, Max..... 1900
Schertz, Christian..... 1916
Walker, Joseph Patrick..... 1909
Walsdorf, Edward H..... 1904
Welsh, Henry..... 1916
Wirth, Adam, Ph.M..... 1904
Wunderlich, Edward..... 1891

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Peyton, Joe Wharton..... 1914

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Auburn.

Jones, Oscar Winthrop..... 1902

Augusta.

Begin, Philippe J..... 1915
Coughlin, John..... 1908
Partridge, Frank Reuben..... 1895

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SWEET, CALDWELL..... 1881

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Dougherty, Daniel T..... 1914

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Fortim, Emile A., M.D..... 1916

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Mann, Roy Edward..... 1915

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Porter, Martin Luther, M.D.... 1904

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Bullard, Morton Leonard..... 1917

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Buxton, Horace Childs..... 1910

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Meserve, Albert Wesley, A.M., B.A..... 1905

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Babcock, Percival Warren..... 1909
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Trimbach, Alfred Richard..... 1915

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Foster, Samuel J..... 1916

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Jarrett, Wm. Ambrose..... 1918

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FRYE, GEORGE CARLTON..... 1879
Hay, Edward Allston..... 1899
Rankin, George W..... 1915
Schlotterbeck, Augustus George. 1896
Tuttle, George O..... 1907
Winn, Howard Atkins, Ph.G.... 1916

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McKenney, Frank Roy..... 1914

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Ring, Harry E..... 1916

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Pearson, Joseph Frederick, Chief Pharm. U. S. Navy..... 1897

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Roberts, Jos. C..... 1910
Stam, Donald Ferguson..... 1910

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Balmert, Clemens Augustus, Phar.D..... 1909
Base, Daniel, A.B., Ph.D..... 1898
Black, James Aitken, Phar.D.... 1910
Boyles, Frank Morris..... 1914

BRACK, CHARLES EMIL..... 1876
Burger, Louis J..... 1915
Cole, Bessie Olive (Miss)..... 1915
Colson, Henry C., Jr..... 1917
Cook, Parker..... 1910
CULBRETH, DAVID MARVEL REYNOLDS..... 1883
Daneker, Howard Nelson..... 1907
Dickson, Frederick W..... 1906
Dohme, Alfred Robert Louis.... 1891
Donnet, John Smith..... 1915
Dunning, Henry Armit Brown, Phar.D..... 1902
Englehardt, Hermann..... 1907
Fouch, William M..... 1906
Frames, John Fuller, Ph.G..... 1890
Gilpin, Henry Brooke..... 1889
Hancock, James Etchberger.... 1907
HANCOCK, JOHN FRANCIS..... 1863
Heuisler, Philip Ignatius..... 1903
Hindes, Joseph Frey..... 1910
Hodson, Eugene Withers..... 1907
Hynson, Henry Parr..... 1890
Kantner, Leahmer, M..... 1914
Kelly, Evander Frank, Phar.D.. 1905
Lotz, Emma Grace..... 1916
Lowry, William J., Jr..... 1906
Maisch, Henry..... 1898
Mansfield, Samuel..... 1898
Meyer, Charles Lewis..... 1901
Miller, Clifford O., Phar.D..... 1912
Morgan, Charles..... 1899
Muehlause, Otto W..... 1915
Muth, George Giustiniani..... 1906
Muth, John Clement..... 1898
Neal, Charles Chaplin..... 1906
Patterson, Anne M..... 1915
Schlosser, Roy B., Ph.G..... 1916
Schulze, Louis, Ph.G..... 1892
Schulze, Wilmer H., Phar.D.... 1916
Shulman, Jacob A..... 1910
Smith, Theodoric..... 1890
Stier, Carl, Ph.G..... 1902
Sullivan, John Patrick..... 1909
Thomas, John Benjamin..... 1906
Walz, Jacob Lee..... 1906
Werckshagen, Otto..... 1907
Westcott, James Walling, Ph.G.. 1890
White, Pinkney McGill..... 1915
Whittle, William Aloysius..... 1908
Wich, Henry Edward..... 1909
Williams, Lawrence Soper..... 1910
WINKLEMANN, JOHN HENRY.... 1864
Wolf, Charles Augustus..... 1906
Wolf, James Carlton..... 1905
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Holtzmann, Charles Hanson.... 1911

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Pearre, Albert Lindsay..... 1906
Williamson, Thomas M..... 1916

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Schindel, David P..... 1914

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White, Edward Riall..... 1911

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Powell, William Cottingham.... 1895

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Swain, Robert Lee..... 1909

Taneytown.

McKinney, Robert Sentman, Ph.G..... 1898

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Boas, Auguste..... 1915
Foulser, Stanley Wm..... 1918
Pendleton, Clarence Isaac..... 1915

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Amrheim, Florin Joseph..... 1915
Ayers, John Raymond, Jr..... 1914
BASSETT, CHARLES HARRISON, PH.G..... 1867
Blake, Harry Wilmarth..... 1909
Bradley, Theodore James..... 1896
Burnham, Alfred Augustus, Jr.. 1891
Burroughs, Geo. Lawrence, Ph.G. 1910
Cabitt, Harry..... 1909

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Carter, Frederick Louis, Jr..... 1912
Charron, Roy Chester..... 1915
Correa, John Francis, Jr..... 1914
Doliber, Franklin W..... 1914
Finneran, James Francis..... 1906
Geddes, Lillian M.(Mrs.)..... 1912
GODDING, JOHN GRANVILLE, PH.G..... 1875
Goodwin, Howard..... 1910
Goolkasian, Bagdasar B..... 1917
Griffin, Lyman Whiting..... 1907
Hunt, Reid..... 1904
Lyons, Michael Francis..... 1910
McIntire, Martin J..... 1910
Monnier, Ernest..... 1913
Muldoon, Hugh Cornelius, Ph.G. 1913
O'Brien, James M..... 1910
PIERCE, WILLIAM HERBERT.... 1879
Sawyer, John R..... 1908
Sharkansky, Eugene Louis..... 1918
Smith, Howard Harry, Ph.G., M.D..... 1911
Staehli, Theodore Hermann.... 1912
Tailby, J. Allen..... 1918
Tapley, Francis Herbert..... 1914
Thompson, Leon Albert, Phar.D. 1907
Tobin, John J..... 1914
Vargas, Heredis Jorge..... 1891
West, Charles Alfred..... 1892
Wiggin, Harry Carleton..... 1910
Wolff, D. O..... 1916
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McCormick, Peter Joseph..... 1909

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Vitz-Simon, Vincent Joseph.... 1918

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Clapp, Lowell Tuckerman..... 1905
Gammon, Irving Parker..... 1906
Hitchcock, Charles H..... 1910
Morey, Arthur C., Ph.G..... 1911
Nagle, Edward G..... 1915

Cambridge.

Acheson, William Robert..... 1910
Dyer, Nicholas F..... 1914
Ford, Charles Mangan..... 1887
Hawthorne, Herman Francis.... 1909
LaPierre, Eli Henry, Ph.G..... 1892
Norton, George Edward..... 1895
Root, Ralph Carpenter, Ph.G... 1916
SHARPLES, STEVEN PASCHALL, S.B..... 1875
Stover, Charles Albert, Ph.G.... 1909

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Braconier, Frank Gunnar, Ph.G. 1916

Chicopee.

Dalton, Ernest..... 1913

Clinton.

Burdette, Bernard Clarence.... 1911

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Archer, Frederick..... 1913
Gifford, Edward Rudy..... 1915

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Coleman, George Edward..... 1912

East Boston.

Packard, Charles Herbert..... 1906

East Saugus.

Stacey, John Edward, Ph.G..... 1914

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Wagner, Arthur Carl..... 1907

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Brunelle, Albert Joseph..... 1910
Corrigan, Dominick F..... 1912

Fitchburg.

Estabrook, Henry Arthur..... 1886

Gardner.

Carroll, Geo. J..... 1914

Gloucester.

Barker, Fred A..... 1914

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Webster, Duane Earle..... 1915

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Harper, John..... 1915

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Bruce, Harry Llewellyn..... 1910

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Heinritz, Lebrecht Gustav..... 1902

Hudson.

Wheeler, Carlton Bancroft, Phar.D..... 1907

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Lewis, Ernest Grant..... 1892
Smith, Linville Holten..... 1892

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Call, Harry Barrett..... 1909
Glover, William Henry, Ph.G... 1891
Jatulevicius, Paul A..... 1916

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Nixon, Charles Frederick, Ph.G. 1900

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Briry, William S., Ph.G..... 1911
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Fonteyne, Gustave J..... 1912
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Davis, Charles Leland, Ph.G.... 1897

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Hudson, Arthur..... 1882
WILSON, BENJAMIN OSGOOD.... 1859

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Hahn, William..... 1910

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Perkins, George H..... 1917

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Olive, George M..... 1911

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Engstrom, Ernest Oscar, Ph.G.. 1906

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Cooper, James W..... 1909

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Orr, Edward Emery, Jr..... 1918

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Adams, James Holmes..... 1906

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BAKER, EDWIN..... 1875

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Dupaul, Armand Merrill..... 1915
Hartwell, Geo. Henry..... 1914

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Lerche, Albert E..... 1913
Thompson, Clifford R..... 1916

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Crossman, George A..... 1872

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Glancy, John Douglas..... 1913

Uxbridge.
Gunn, George Baylies..... 1917

Vineyard Haven.
Armstrong, Thomas Call..... 1915

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Hudson, John Robert..... 1910

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Ruddy, Joseph Michael..... 1918

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Fitzpatrick, Patrick Joseph..... 1908

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Follensby, Edna Mildred (Miss). 1918

West Medford.
Shedd, Edwin Walter..... 1910

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Sumner, Jennie Henrietta (Miss), Ph.G..... 1909

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Pratt, James Weston..... 1915

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Knight, Frank Herbert, A.B., Ph.G..... 1909

Winthrop.

Stover, Wm. Francis..... 1914

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Hurlbert, William Alexander.... 1909

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Bitowski, Chas. Casimir..... 1918
Brewer, Howard Dickinson.... 1902
Flint, William S..... 1909
Guerin, James Francis..... 1898

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Albion.

Moore, Maxwell S..... 1917

Ann Arbor.

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Glover, Clifford C..... 1913
Haarer, Oscar..... 1917
KRAEMER, HENRY..... 1892
STEVENS, ALVISO BURDETTE.... 1885
Wagner, Leonard R..... 1915

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Goodale, Martin H..... 1910

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Bodin, Edwin T..... 1915

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Bertram, E. O..... 1915
Blome, Walter H..... 1915
Boldt, A. Herbert..... 1915
Bradt, Frederick T..... 1915
Briggs, Clifton Henry..... 1914
Casey, Jas. P., M.D..... 1914
Chase, Walter M..... 1915
Crane, George W..... 1914
Cromer, Andrew J..... 1918
Doty, Wirt P..... 1914
Douglas, Mathew H..... 1914
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Ebner, Frank Gannon..... 1918
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Fiero, Wm. W..... 1914
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Nelson, Edwin Horatio..... 1904
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Palmer, Gertrude M..... 1917
Perrin, D. Edmund..... 1915
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Pinkerton, Howard..... 1914
Rohnert, Frederick..... 1915
Rovin, Alexander M..... 1917
Rowe, Lewis W..... 1916
Ryan, Frank Gibbs..... 1892
Schaupner, John Philip..... 1915
Schettler, Geo. M..... 1914
Scott, Frank Genio..... 1917
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Seltzer, Leonard Adams, Ph.C... 1899

Snyder, George T..... 1917
Starwalt, Ellis Jayson..... 1915
Stevens, Grant W..... 1910
Stewart, J. A..... 1915
Strawn, May, Ph.C. (Miss)..... 1912
Taylor, Francis Owen, Ph.C..... 1912
Thompson, Frank Augustus, Ph.C..... 1908
Van Vleet, M..... 1915
Vernor, James..... 1866
Washburn, Crosby B..... 1918
Weaver, Clarence Albert..... 1909
Webster, John Hugh, Ph.G..... 1911
Wheeler, Albert Alton..... 1906
Young, Andrew Palmerston..... 1914

Flushing.

Sprague, Wesson Gage..... 1895

Grand Rapids.

Hawley, Norma C..... 1916
Jongejan, Cornelius Henry..... 1910
Kirchgessner, William Carl, Ph.C..... 1903
Vellema, Peter..... 1915

Hersey.

Delzel, J. T..... 1915

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French, Adelbert P..... 1915

Ionia.

Gundrum, George..... 1882

Iron Mountain.

Seibert, George Frederick..... 1909

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Light, S. Rudolph..... 1914
Todd, Albert May..... 1885

Leland.

Lederle, Archibald L..... 1913

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Koon, Chas. S..... 1915

Saginaw.

Heim, William..... 1916
Miller, William L..... 1915

Sandusky.

Hoffman, Herbert H..... 1918

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Alexandria.

Holverson, Henry T..... 1909

Detroit.

MacGregor, Charles..... 1916

Duluth.

Abbett, William Allen..... 1901

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Kingman, Ignatius..... 1917

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Beise, John Henry..... 1908

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Johnson, M. G..... 1917

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Smetana, William S..... 1915

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Elfstrand, Wilhelm..... 1905

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Allen, E. Floyd..... 1885
Anderson, Frank William..... 1916
Bachman, Gustav..... 1905
Bercowitch, Jack D..... 1917
Butters, Charles Hayes..... 1907
Danek, John Francis..... 1895
Erkel, Arthur George, Ph.C..... 1910
Gamble, Stewart..... 1897
Griffen, Truman..... 1909
Hirscher, Alfred Meade..... 1918
Huhn, Charles Hugo, Ph.C..... 1905
King, George Alexander Newton. 1892
Newcomb, Edwin Leigh, P.D.... 1906
Petersal, Hugo O..... 1915
Robitshek, Irving H..... 1914
Rogers, Charles Herbert..... 1914
Stuart, Josephine A. Wanous, (Mrs.)..... 1897
Sweet, William Herbert..... 1905
Tupper, Edward A..... 1914
Wulling, Frederick John, Ph.G., LL.B..... 1893

Morristown.

Dargavel, John William..... 1917

New Duluth.

Garl, Chester E..... 1916

Ortonsville.

Nielson, John..... 1897

Pine City.

Breckenridge, John Y., Jr..... 1915

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Pipestone.

Menzel, Max..... 1915

St. Paul.

Bartleson, Rasmus..... 1915
Bollinger, Clifford H..... 1912
Collier, William Kelley..... 1892
Conger, Frederick Albert..... 1907
Frost, William Arthur, Ph.G..... 1892
Heller, Chas. T..... 1906
Jelinek, John Peter..... 1907
Johnson, Hans Martin..... 1915
McCall, Henry..... 1910
Messing, Richard J..... 1913
Noyes, Charles Reinold, B.A..... 1908
Parker, Frederick M..... 1902
Rietzke, Herman W..... 1909
Smith, Frederick Alfred Upsher, Ph.C..... 1907
Strate, Herbert A..... 1917

Tyler.

Vodheim, Joseph..... 1917

Worthington.

Morland, Robert Lawson..... 1909

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Aberdeen, Monroe Co.

Eckford, Joseph William..... 1883

Flowers.

Pigott, Charles Dewitt..... 1917
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Gloster.

Whittington, C. Emerson..... 1917

Gulfport.

Lewis, Robert Henry, Jr..... 1918

Jackson.

McGee, James Clyde..... 1915

Kosciusko.

Boyd, Hugh Lee..... 1916

Leakesville.

Anding, C. E..... 1914

Meridian.

Kendall, Gus C..... 1913

Natchez.

Geisenberger, Abe H., Jr..... 1917

Philadelphia.

Stribbling, J. H..... 1917

Poplarville.

Smith, Fred W..... 1916

Port Gibson.

SHREVE, JOHN ALEXANDER..... 1880

University.

Faser, Henry Minor..... 1910
Swan, John Nesbit..... 1918

Vicksburg.

Heckler, Michael Schuster..... 1918

Water Valley.

Azlin, Arthur Paul..... 1917

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Boonville.

Mittelbach, William, Ph.G..... 1891

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Bowen, Cyrus West, B.S., M.S., M.D., Ph.G..... 1912

Cape Girardeau.

Miller, Edwin Alexander, B.Pd., Ph.G..... 1912
Miller, Isaiah Benjamin..... 1912

Craig.

Cox, Edwin G..... 1914

East Prairie.

Doyle, Robert A..... 1914
Hawkins, John M..... 1915

Hannibal.

Davis, John T., Jr..... 1918

Kansas City.

Amos, Wilbur Stanton..... 1908
Federmann, William Martin..... 1901
Fuller, James Cook..... 1918
Hess, Paul Ludwig..... 1892
Linck, Truman A..... 1916
Whitney, David Victory, Ph.G... 1903
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Wirthman, John George..... 1903
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Zinn, Charles Edward..... 1909

Kirksville.

Stookey, H. Frank..... 1914

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Metzger, Arthur S., Ph.G., Ph.C. 1908

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Llewellyn, Henry Duncan..... 1915

Nevada.

Ballagh, Wilfred Thomas..... 1901

New Madrid.

Hummel, John Andrew..... 1901

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Bender, Walter Comstock..... 1909

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Ambler, Jessie H..... 1914
Batdorf, Lydia Franke..... 1915
Berg, Frantz F., Ph.G..... 1914
Blakeslee, Louis George..... 1903
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Brewer, Justin Sewall..... 1912
Buckland, Thomas A..... 1914
Burkart, George Adrian..... 1915
Caspari, Charles Edward..... 1902
Claus, Otto Ferdinand, M.D..... 1901
Coussens, Bettie Prince (Miss)... 1910
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Falk, John Charles, Ph.G., M.D. 1900
Fricke, Frederick Henry..... 1901
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GOOD, JAMES MICHENER..... 1871
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Hagenow, Theodore Chas..... 1915
Hahn, Charles Wm. John Henry 1901
Hammett, Frank U..... 1914
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Hubbard, Winfield Scott, Ph.G., B.S., M.A., Ph.D..... 1912
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Koch, Albert H..... 1914
Kring, Gustave..... 1912
Kurtz, Irwin William..... 1904
Lambert, Alert Bond..... 1914
Lehmann, Louis John..... 1911
Lieberstein, Jacob..... 1913
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Martin, Albert J..... 1918
Merner, Garfield David..... 1918
Merrell, George Robert..... 1901
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Meyer, Carl F. G..... 1918
Noble, J. Merner..... 1917
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Prichard, Leslie Elridge..... 1918
Rehfeld, Gustav..... 1914
Ruf, Frank A..... 1913
Salb, Oscar G..... 1915
Schlueter, Robert Ernst, Ph.G., M.D..... 1904
Schoenthaler, John Paul..... 1901
Seitz, Lorenz Aloysius..... 1901
Sennewald, Emil August..... 1900
Smith, Paul W..... 1912
Speckart, Otto Norbert..... 1914
Sternfels, Urvan Ruiz..... 1918
Stevenson, Arthur Earl..... 1912
Stolle, Henry Jasper..... 1903
Stuart, Francis Joseph..... 1913
Sultan, Frederick William..... 1901
Suppan, Leo Richard August.... 1904
UHLICH, FERDINAND GOTTLIEB.. 1881
Veillon, Lewis, M.D..... 1915
VORDICK, AUGUST HENRY..... 1874
Wallbridge, Cyrus Packard..... 1901
Wall, Otto Augustus..... 1884
Warren, Lewis Eugene..... 1909
Welsh, Joseph Bruner..... 1910
WHELPLEY, HENRY MILTON, Ph.G., M.D..... 1887
Wilkerson, Jerome Aloysius..... 1911
Williams, N. Emery, Ph.G..... 1912
Wolff, Edward Henry..... 1901

Sedalia.

Bard, William E..... 1901
SMITH, OTIS WILMER..... 1903

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Trantham, Isham A..... 1914

Webster Grove, St. Louis Co.

Garvin, William S..... 1917
Mueller, Ambrose..... 1894

Windsor, Henry Co.

Wesner, Henry Clay..... 1901

MONTANA.

Absarokee.

Erb, Olin..... 1917

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Belgrade.

Porter, W. P..... 1915

Billings.

Chapple, Charles J..... 1915

Boseman.

Kraker, John Lewis..... 1912

Butte.

Montgomery, W. R..... 1915
Rockefeller, Howard..... 1900

Great Falls.

Lapeyre, Ben. E., Jr..... 1916
Woehner, Frederick A..... 1909

Helena.

Starz, Emil..... 1916

Kalispell.

Bienz, Thomas H..... 1916

Livingston.

Scheuber, Frank Augustus..... 1905
Schoenholzer, Emil..... 1917

Missoula.

Bateman, Herbert Howard..... 1909
Coffee, Sidney J..... 1909
Mollett, Charles Edwin Francis, Ph.C..... 1909
Peterson, Alex F..... 1914
Peterson, Gustave F..... 1916
Valentine, Charles Philip..... 1915

Sheridan.

Walter, Adeline..... 1918

NEBRASKA.

Arlington.

Weber, Don Caesar..... 1908

Atkinson.

Schultz, William Ludwig..... 1915

Auburn.

Dort, Edward Harvey..... 1903

Creston.

Ewing, Samuel E..... 1913

Edgar.

Brookley, Will..... 1915

Fairbury.

Pease, Autumn Vine..... 1893

Holbrook.

Butler, Guy..... 1909

Holdredge.

Fink, Daniel Jacob..... 1903

Kenesaw.

Mikkelsen, Niels..... 1903

Lincoln.

Day, Elsie..... 1915
Haschenburger, Edmund Ommen, Ph.G..... 1907
Lyman, Rufus Ashley, A.B., A.M., M.D..... 1908
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Thompson, Harry Landis..... 1917

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Oconto.

Jones, Orel, Ph.G..... 1911

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Forbing, John W..... 1915
Gaskill, David Leslie..... 1915
Gerald, Herbert Franklin, M.D. 1906
GERING, HENRY R..... 1907
Green, James Harvey..... 1912
Johnson, Leland A..... 1916
McConnell, Andrew B..... 1915
McEwen, Irving..... 1914
Newton, Howard Chamberlain... 1912
Piel, Warner A..... 1912
Schuhl, Albert L..... 1918
Sherman, Charles Rollin..... 1889

Ord.

Beranek, Edward Frank..... 1915

Overton.

Hoye, Daniel J..... 1911

Plattsmouth.

Fricke, Frederick George..... 1903
Mauzy, James G..... 1915

Shelby.

Thelen, Karl M..... 1915

University Place.

McBride, James G..... 1916

NEVADA.

Elko.

Englert, William Robert..... 1915
Taber, Joseph Mark..... 1912

Tonopah.

Piercy, Joseph C..... 1918

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Berlin.

Bailey, Fred..... 1916

Groveton.

Elliott, Fay Harold..... 1916

Manchester.

Knowlton, George Harry..... 1907

Portsmouth.

Dunbar, Eugene A..... 1916
Grace, William Day..... 1896
Green, Benjamin..... 1888

NEW JERSEY.

Atlantic City.

Crawford, Dean Burton..... 1916

Bayonne.

Dodge, Francis Despard..... 1910
Horwitz, Lewis M..... 1917

Bogota.

Fried, Leopold H..... 1914

Bridgeton.

Dare, Charles Ford..... 1889
Jorden, Henry Albert, Ph.G..... 1902
Whipple, Oscar Kellog..... 1916

Burlington.

Hires, Lewis Moore..... 1916
Sparks, Edgar Reed, Ph.G..... 1909
Williams, George Thomas..... 1916

Camden.

Barrett, Charles Llewellyn..... 1902
Beringer, George Mahlon..... 1893
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Reiser, Philip..... 1913
Weiser, William Pfeiffer..... 1902

Collingswood.

Sturmer, Julius William, Ph.G., Phar.D..... 1901
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Quin, Harry J..... 1918
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Urdong, Bertha..... 1917
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Coll, Paula..... 1916
Curbelo, Angelica (Miss)..... 1916
Delgado, Joila Estrella, M.D..... 1915
Diaz, José Guillermo..... 1907
Falcon, Luisa (Miss)..... 1916
Faundo, Eduardo Garcia..... 1915
Fortim, Elisa M. (Miss)..... 1916
Goltz, Carl Julius..... 1915
Herrera, Francisco, M.D..... 1907
Johnson, Manuel..... 1907
Johnson, Theodore, M.D..... 1911
Lagomasino, Rosa T. (Miss)..... 1916
Llarena, Maria Gonzales y..... 1913
Ortiz, Piedad Nogueira y (Miss).. 1916
Remirez, Prof. Francisco..... 1912

CUBA—FOREIGN COUNTRIES.

Sarra, Ernesto..... 1907
Taquechel, Francisco..... 1908

Manzanillo.

Silveira, Miguel Sanchez..... 1916
Vasquez, Carlos, R.V., M.D..... 1914

Mariano.

Ramirez, Rogelio H., M.D..... 1912

Santiago.

Berengner, Jose M..... 1918
Rodriquez, Bernando F..... 1916

MEMBERS RESIDING IN FOREIGN COUNTRIES.

(*Except Canada and Cuba.*)

Albert, Moses Mordechai, B.A., B.C., M.Phm., Beirut, Syria, Turkey.... 1916
Andrade, Cesar Daniel, Guayaquil, Equador, S. A..... 1918
Chapman, Oswald, Panama City, Panama..... 1916
Charles, Charles Joseph Innocent, Limon, Costa Rica, A. C..... 1916
Duignan, John, Deolili, India..... 1914
Dumphy, Richard Matthew, Vera Cruz, Mexico..... 1916
Fong, Job, Canton, So. China..... 1913
Gonzales, Teodoredo M. Gutierrez, Barranquilla, Columbia, S. A..... 1915
Hallaway, Robert Railton, B.Sc., Ph.D., Carlisle, England..... 1905
Heuschling, Allen J., London, England..... 1918
Jones, José Antonio Gonzelez, Columbia, S. A..... 1915
Jurado, Bolivar, Ph.C., Ph.B., Panama City, Panama..... 1915
Ladakis, Triantaphylle, Beirut, Syria..... 1907
McMullin, David John, H. S., U. S. N., Pago Pago, Tutuilla, American Samoa..... 1916
Murray, Alexander, San José de Costa Rica, C. A..... 1903
Patch, James Alfred, Beirut, Syria..... 1903
Pirie, Alfred Mitchell, Cartago, Costa Rica, C. A..... 1903
Ramirez, Alberto Roldan, Farmacia El Globo, David, Panama..... 1916
WELLCOME, HENRY SOLOMON, London, England..... 1875
Wooyenaka, Keizo, Tokio, Japan..... 1907

LIST OF MEMBERS WHO HAVE DIED SINCE THE PUBLICATION OF THE 1915 YEAR BOOK.

May 1, 1917, to February 1, 1918.

Deceased.	Residence.	Elected.
Caspari, Chas., Jr.	Baltimore, Md.	1883
Farmer, F. E. D.	Rutland, Vt.	1914
Ferguson, Geo. A.	New York, N. Y.	1905
Fischnar, John F.	Chicago, Ill.	1905
Fox, Peter P.	Philadelphia, Pa.	1869
George, Chas. Theo.	Harrisburg, Pa.	1873
Gordon, Fred. T.	Philadelphia, Pa.	1911
Grimany, Frederico.	Santiago de Cuba.	1912
Hassinger, Samuel E. R.	Philadelphia, Pa.	1880
Holzhauer, Chas.	Newark, N. J.	1873
Hurd, John C.	Somersworth, N. H.	1892
Isakovics, Alois von.	Monticello, N. Y.	1905
Land, Robert H.	Augusta, Ga.	1859
McFadden, Eugene A.	Hackensack, N. J.	1915
Muth, John S.	Baltimore, Md.	1898
Myerson, Isaac A.	New York, N. Y.	1906
Otis, John C.	Cincinnati, Ohio.	1913
Remington, Joseph P.	Philadelphia, Pa.	1867
Schlotterbeck, Julius O.	Ann Arbor, Michigan.	1888
Stiefel, Albert F.	Pittsburgh, Pa.	1909
Weinstein, Joseph	New York, N. Y.	1905
Weldon, George	Paris, Idaho.	1915

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